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HINTS TO POTATO GROWERS

New Jersey State Potato Association

MAY 30 1932

Vol. 2, No. 1

NEW BRUNSWICK, N. J.

May, 1921

Serious Loss from Rotting Seed Pieces Reported from New Jersey and Other States

High Storage Temperature One Cause

Numerous reports have come to the Experiment Station concerning the rotting of the seed piece. In the Holmdel section fields were examined where there was only a 75 per cent. stand, making it necessary that a large acreage be replanted, and latest reports show that approximately 1500 barrels have been replanted in the Freehold-Holmdel section. While most of the loss was caused by soft rot, there was considerable late blight rot, wire worms and spindling sprouts. These troubles have not been restricted to New Jersey alone, as they have been reported from a number of the important potato-growing sections.

No one trouble can be ascribed as being the cause of the loss experienced in Monmouth County. It was no doubt augmented by the storage conditions of the past winter when the high temperatures promoted the development of rot-producing organisms. Other cases were reported where seed that became heated after it was cut rotted in the field. Dusting the seed with sulfur after it was cut was of little value in preventing rot, as fields were observed where the percentage of rot was very high regardless of the fact that the seed had been dusted.

In most cases the rotting was caused by a bacterium. Unquestionably in some cases the bacteria were present on the seed when cut, but the indications are that most of the trouble arose through the fact that the organism was present in the soil and that the soil temperature and moisture conditions were such as to favor its development.

No Sources Free from Trouble

In Monmouth county, while seed from some sources tended to rot to a greater extent than that from others, there were no cases observed of absolute freedom from rot in seed from any one source. On the other hand, reports from South Jersey indicate that the condition of the northern seed has resulted, in many cases, in replanting, while cases of rot in the home grown seed have been reported.

Wire Worms Do Mischief

Wire worms are very abundant throughout Monmouth and Mercer counties; fields were observed where 50 per cent. of the seed pieces were infested, some pieces containing as many as 25. In many instances their entrance into the seed piece was followed by rot-producing organisms so that the seed field was completely destroyed. In

other fields while wire worms were very severe there was no rot. There is no control for this pest in the field; control measures must be based on proper rotation. In most cases observed the greatest damage was on potatoes following grass.

Plenty of Spindling Sprout

Spindling sprout—so called because of the very much weakened appearance of the sprout, is very abundant, especially in some of the plantings from northern seed. This trouble cannot be laid to the grower of the seed, as the storage conditions resulting from the warm winter are no doubt largely responsible for it. In addition to spindling sprouts some fields planted with northern seed show poor germination. This also is probably due to the storage conditions.

It is questionable if any of the northern seed was free from late blight rot; in some cases the amount was very large. In most cases the grower discarded tubers showing the brown discoloration, but this trouble developed to a large extent after the seed was planted—with poor germination as the result.

How Potato Crop Looks in Other Producing Sections

In the Eastern Shore section the season is about 10 days early. The acreage is somewhat decreased, with an 85 per cent. stand resulting from rot of the seed piece. Shipments should begin about May 25 and continue at least two months. A local estimate places the shipments from the whole eastern shore section at 12,000 car loads. In connection with the rot it is interesting to read a report by Dr. Wm. Stuart, of Washington, on the conditions in the Norfolk section.

"In many fields examined the germination ran as low as 20 to 30 per cent. All graduations were noted from these figures to that of a perfect stand." Dr.

Stuart attributes his rot to the following causes:

Mild Winter Started Trouble

"The mildness of last winter coupled with poorly insulated and ventilated storage houses furnished conditions favorable to germination and also to infection of the tubers by saprophytic and parasitic organisms—the former attacking the tubers through surface injuries and the latter through invasion, under suitable conditions of healthy tissue. The seed may have and undoubtedly did in some cases, sustain further injury through heating after being cut. This supposition is all the more probable on account of the high temperature that occasionally prevailed during the planting season."

Corn Root Maggot Does His Share

"The infestation of the seed pieces in some fields by large numbers of the corn root maggot has undoubtedly been responsible for some failure of the seed pieces to germinate. Decay of the seed piece in many cases seems to be associated closely with the progress of the corn root maggot. Numerous examples may be found, however, in which the seed piece has decayed without the presence of the corn root maggot and when in such cases the seed was planted shortly after cutting, it is difficult to offer a satisfactory explanation of the real cause of the decay." The growers in Central Jersey will thus see that the conditions as reported by Dr. Stuart are very similar to those that exist in New Jersey.

News from Other States

The Megget and Charleston section of South Carolina will ship from 1500 to 2000 cars from early May to the first week of June. Eight principal shipping sections from Louisiana expect a shipment of 1000 cars during May. Early sales are reported at \$1.75 per 100 pound sack with slow demand.

(Continued on Page 4).

Hints to Potato Growers

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AND STILL IT GROWS

THE PRESENT indications are that the acreage of second crop potatoes entered for certifications this year will be greatly increased over that of last year.

In this connection it is interesting to note that in 1919 the first year of seed certification, 153 acres were entered, this was increased to 200 acres in 1920, and this year it is expected that approximately 700 acres will be entered. The standard set for this seed with regard vigor and freedom from disease has been high in the past and the future tendency will be to make it still higher. The buying grower in the central counties cannot afford to go elsewhere to purchase seed when he can be sure of a large amount of vigorous high-yielding seed in his own State.

The committee on seed certification of the State Potato Association has the question of seed improvement under consideration at all times and has done much to place the growing of certified seed on a firm basis. This committee met in Philadelphia, Thursday, May 12, with the following members present: J. Gilbert Borton, Walter L. Minch, Frank Jones, J. Harry Kandle, Dr. Mel. T. Cook, H. B. Weiss and Mr. West represented the State Department of Agriculture. The committee was unanimously of the opinion that the present standards should not be lowered. In spite of the fact that the northern states which certify seed allow tubers showing large percentages of scab and rhizoctonia to pass, it was the general opinion that the limits for New Jersey seed should remain as they are, namely 5 per cent. for scab and 5 per cent. for rhizoctonia.

The only change of any importance in the rules for 1921 was one that will benefit the grower. In 1920 no fields could be entered for certification after August 10. This was a hardship to some growers, as in certain instances after the plants were up, their condition was such as to make it desirable that the field be entered for certification, but because of the time limit they could not be accepted.

This difficulty will be eliminated this year by the adoption of a sliding scale. Under the new rules a field may be entered as late as August 25 with the provision that should the acreage entered be more than can be inspected adequately by the available inspection force, preference will be given to the applications first received.

In view of the fact that a considerable increase is expected this year in the acreage entered for certification, with a corresponding increase in the cost of the inspection service, the committee decided that the present fees be retained.

In the near future the State Department of Agriculture will issue a circular

Date Due

containing the new rules, a copy of which will be mailed to the members of the State Association.

Time to Start Attack on Colorado and Flea Beetles

While there is no reason to believe that the number of potato insects will be greater this year than in other years, normally the damage they do is very large. This is especially true of the flea beetle. The grower cannot afford to overlook the depredations of this pest, as it is responsible for considerable injury to the crop. This injury results not only through the fact that a large per cent. of the leaf area is destroyed, but all evidence points to the fact that the holes in the leaf pave the way for subsequent infection by early blight.

In some sections of the State the Colorado beetle has already appeared in large numbers, and it is likely to be abundant. Control measures for these pests should be undertaken at once. Protect the young plants. The earlier the spray or dust treatment is made the greater will be the benefit derived. Whichever method is adopted, remember that power is the first requirement for success. The plants must be thoroughly covered.

The Colorado beetle is readily controlled by applications of any of the standard arsenicals such as calcium arsenate, arsenate of lead, or Paris green. The first two mentioned are probably the most desirable, since because they contain less soluble arsenic, they are less likely to burn the foliage. When applied as a spray, these mixtures

should be used at the rate of 4-6 pounds in 100 gallons of water, the larger amount being used when old bugs are present in the field. Applications should be made at the rate of 100 gallons to the acre. Any of the standard arsenicals may be added to homemade Bordeaux mixture without loss of efficiency.

Flea beetles are more difficult to control than the Colorado beetle since no method has been discovered of poisoning them. Control measures must be based on keeping the plant covered with some material to act as a repellant. If the plant is thoroughly covered with Bordeaux mixture, it will be afforded very good protection. For the control of the flea beetle and Colorado beetle as well, if a sprayer is not available, a good duster will be found satisfactory. Cover the plants with hydrated lime, used at the rate of 30 pounds per acre. The lime alone will not control the Colorado beetle, but this may be accomplished by adding an insecticide. Add Paris green at the rate of 2-4 pounds per acre and either of the others at the rate of 4-6 pounds.

How Potato Crop Looks in Other Producing Sections

(Continued from Page 2).

The acreage in Delaware and Maryland is generally reduced, with some increase in the Rocky Mountain sections and a reported decrease in the Great Lake regions. The acreage in Northern Maine will be about as usual. In Minnesota the early crop acreage is decreased, but planting probably is increased in the Red River Valley district and Muskogee section Oklahoma.

SB211
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HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 2, No. 4

NEW BRUNSWICK, N. J.

August, 1921



Does It Pay to Grow Seed At Home?

There are some growers who still believe in getting their seed from the north, but the owner of this field is not among them. Home grown seed produced the stand on the left; that on the right was from northern grown.

As a result of the remarkable showing made by New Jersey seed this year the growers are convinced that there will be a brisk demand for it, and they have increased their acreage to meet this demand. The encouraging feature of this increase in acreage is that the growers are not going ahead in a slipshod manner, but are attempting to grow the best seed that it is possible to grow. There is no need of saying to you growers in central Jersey that here is a supply of good seed in your own state. You know it already and should take advantage of it.

The present plans are for Salem and Cumberland counties co-operating with the State Potato Association to conduct a run in these two counties this fall. The purpose of this run will be to examine the late crop. A day will be spent in each county. Visits will be made to as many fields entered for certification as is possible. This tour will probably be conducted October 5 and 6. A complete program will be sent out in the near future. Growers from Long Island and Connecticut have already stated that they would be present. The growers of central Jersey cannot afford to miss this opportunity to examine second croppers growing.

Put Bordeaux in Your Old Spray Tank and Spray! Spray! Spray!

Let us spray! It is catching! Every grower of second crop potatoes is saying it! There is no question in their minds as to the value of spraying. The results of tests conducted for the past 5 years have demonstrated that spraying second croppers with Bordeaux mixture pays. In the 2 years of 1919 and 1920 when late blight was very severe, 5 applications of Bordeaux resulted in an increase of 42 bushels per acre. At \$2.40 a bushel, the price paid for second croppers at digging time last year, the net returns were approximately 90 dollars an acre in favor of spraying. It is apparent that there is some reason for the ejaculation. Let us spray!

The possibility exists that late blight will not be a serious factor this year. Even in the absence of this disease, however, and with only two and three applications per acre the average increase over a three-year period was 10 bushels. There is little question but that this increase would have been larger had the number of applications been increased to four or five.

In this connection it is advisable that the importance of the late spray applications be pointed out. The tendency in the past has been for the average grower to cease spraying operations too early in the season. If any applications are to be omitted, it is far better that they be the early ones. Several instances were noted last year where late blight appeared after the last treatment had been made. As a result the plants were afforded little protection against blight and were soon killed. At least 4 spray applications should be made; no definite statement as to the number can be made however, as this must be determined largely by weather conditions and the presence or absence of late blight.

A Spray Ring

The growers of second croppers mean business. They intend to spray and spray thoroughly. An indication of what

they are doing is evidenced by the fact that a number of growers in the vicinity of Hancocks Bridge, Salem County, have formed a spray ring. Having obtained one of the best sprayers on the market, they are now looking for a man to put in charge of the work. It will be his job to see that every acre grown by these men is thoroughly sprayed. He will follow a definite route so that he can spray at each farm at approximately 10 day intervals.

How to Spray

This may be an old story, but it is well worth repetition. Pressure is the first essential. For best results the machine should develop at least 150 pounds pressure. Nozzle adjustment is of next importance. There should be at least three nozzles to the row, one pointing downward and two directed inward and slightly upward. With proper pressure and this arrangement of the nozzles the leaves will be covered with a film of Bordeaux mixture.

What to Spray With

Bordeaux mixture. The kind that you make in your own back yard. No mystery to it, just plain common horse sense. It is cheap, easily made and efficient.

Bordeaux mixture is a combination of copper sulphate and lime in water. The formula commonly recommended for use for potato spraying is the 5-5-50 mixture. This means 5 pounds of copper sulphate, 5 pounds of lime in 50 gallons of water. In the preparation of Bordeaux mixture the first step is to make up stock solutions of copper sulphate (blue stone) and lime as follows:

Lime stock solution—Slake 50 pounds of lime in a barrel and when it is properly slaked, add enough water to make the total up to 50 gallons.

Copper sulphate stock solution—Suspend 50 pounds of copper sulphate in a burlap bag in 50 gallons of water. Ad-

(Continued on Page 4)

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ALL PULL TOGETHER FOR A BIGGER SHOW

THE POTATO growers of New Jersey have every reason to be discouraged this year. Poor germination—drought — lice—all three in a row and any one of them enough to ruin a crop! Yes! They have a reason for being discouraged: But are they? Not so that you could notice it!

Fred Gardner is on the war path again. He persists in saying that the state potato show this year, like the old fashioned circus, will be bigger and better than ever. Fred is a booster. When he is behind a movement, it is bound to go, so be prepared right now to see the best potato show you ever saw when you attend Agricultural Week at Trenton this winter.

Now is the time to select exhibits. Don't try to get one from a load of potatoes. Follow the digger in the field and you will soon have an exhibit to be proud of. The size of the exhibit remains the same as last year, 15 pounds, but select 20 pounds to allow for shrinkage.

Start getting your exhibit together now. Don't depend on the County Agent to do it. It is impossible for him to visit every potato grower in his county and help him select an exhibit. Select your own and then call him up—he will be glad to stop for it. With everybody working together on this the N. J. State Potato Show can be made the best in the country. There will be prizes for all this year—in addition to the state prizes, there will be a prize for the best exhibit in each class in each county.

Don't put it off—select an exhibit now! Everybody pull together on this.

Let us all co-operate to put New Jersey on the map as one of the foremost potato growing states of the country.

HASH

The condition of the crop in New Jersey on August 1 was 52 per cent of a normal, indicating a yield of 72.8 bushels per acre, and a production of 7,062,000 bushels, as compared with 14,820,000 bushels last year, and 10,298,000 bushels, the average production for the past ten years.

For neighboring States the forecast of production for this year and the final estimate for last year are as follows: Maine, 21,835,000 bushels, 22,140,000 bushels; New York, 30,551,000 bushels, 46,250,000 bushels; Michigan, 18,870,000 bushels, 35,700,000 bushels; Minnesota, 20,047,000 bushels, 28,025,000 bushels; Wisconsin, 19,826,000 bushels, 33,264,000 bushels; Pennsylvania, 23,060,000 bushels, 36,455,000 bushels.

Sulfur For Scab Has Made Good

Early Results for 1921

In 1919 the N. J. Experiment Station started a series of tests to determine the value of sulfur for the control of potato scab. The results of the first year's work were very encouraging, so much so that it was continued on a larger scale in 1920. The results under the weather conditions which prevailed last year were exceptionally good, which led a number of growers to use sulfur this year.

In view of the fact that the beneficial action of sulfur in the control of scab results from its oxidation in the soil, which process is dependent to a certain extent on the amount of moisture in the soil, the possibility presented itself that in a dry season the sulfur might not be changed and consequently would not prove to be successful in the control of scab. This season has been the driest for a number of years so that the outcome of the sulfur tests has been watched with considerable interest.

Sixteen tests are being conducted this year in various parts of the state. While no definite statement will be made until all of these have been harvested and the results tabulated, it will not be out of place to examine briefly the results already secured.

In a test conducted at R. E. Colyer's, near Jamesburg, 90 per cent of the potatoes on plots receiving no sulfur were unsalable. In this test sulfur was applied at the rate of 300, 600 and 900 pounds per acre. On the plots receiving 300 pounds of sulfur 23 per cent of the crop was unsalable, while on the plots treated with 600 and 900 pounds 22 and 9 per cent respectively were unsalable, a marked difference in favor of the sulfur treatment.

Very good results were obtained on the Thomas Applegate farm near Farmingdale. On the plots receiving no sulfur 52 per cent of the crop was unsalable, while where sulfur was applied at the rate of 600 pounds per acre, only 7.8 per cent were unsalable. In another

test, in Salem County, 50.3 per cent of the crop was unsalable where no sulfur had been used, on adjoining rows treated with 300 and 600 pounds of sulfur only 17.1 per cent and 8.6 per cent respectively of the crop was unsalable.

From the results of the 3 tests quoted here it is apparent that the use of sulfur for the control of scab has not failed this year. In a future number of "Hints" a complete discussion of this year's results with sulfur will be given.

How to Spray

(Continued from Page 2)

just the bag so that it is suspended just beneath the surface of the water. Never dump bluestone into a barrel and then pour water on it, it will dissolve, but the action will be very slow.

How to Prepare the Mixture

In using the above stock solutions 1 gallon represents 1 pound of the material in question. Following is probably the simplest method of preparing 100 gallons of a 5-5-50 mixture.

(1) Start the water running into the spray tank. With the water running add ten gallons (10 pounds) of the bluestone solution.

(2) With the water still running and when the tank is almost full add ten gallons (10 pounds) of the lime solution. When this has been done and the tank is filled, the mixture is ready to apply.

REMEMBER

(1) Have stock solutions made up ahead—it saves time.

(2) Never pour undiluted lime water and the copper sulphate solutions together.

(3) If insects are present add 4-6 pounds of arsenate of lead to each 100 gallons of Bordeaux mixture.

(4) Spray with 3 nozzles to the row, and at least 150 pounds pressure. Apply at the rate of 100 gallons per acre.

(5) Spray by the barometer—not the calendar. Remember that fungi develop best under cool, moist conditions. If every ten days is not often enough, spray every week. Keep the vines covered for success.

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HINTS TO POTATO GROWERS

New Jersey State Potato Association 1932

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NEW BRUNSWICK, N. J.

November, 1921

Sulfur Spells Success in Potato Scab Control

But Rules of "When" and "How Much" Must be Obeyed

W. H. MARTIN

Investigations on the use of sulfur for the control of potato scab have been conducted by the writer for 3 years, and the results of the work indicate that where the crop is quite scabby and where the sulfur is applied at the proper time, and in proper amounts, the treatment should result in a considerable reduction in the number of scabby tubers.

Too much emphasis, cannot be placed on the importance of applying the sulfur at the right time, the failure of the treatment in several cases being traced directly to the neglect of this point. For instance, an investigation of several cases where the results were not as good as expected revealed the fact that the sulfur had been applied from two to four weeks after the crop was planted. From our present knowledge it is essential that the application be made before the crop is planted and that the sulfur be mixed thoroughly with the soil.

Avoid Using Too Much

Several other instances of the reported failure of sulfur to show any beneficial effects resulted from the fact that no untreated rows were left. As a consequence of this, there was no way of measuring any benefit derived from the sulfur treatment. Again, in other cases excessive amounts of sulfur have been used. One case was reported where 500 pounds were applied to a soil already acid. Even without the sulfur, this soil had been sufficiently acid to keep the potatoes from becoming scabby. In another case 1200 pounds of sulfur had been applied. In both of these cases the

grass crop following the potatoes was injured.

When to Use Sulfur

It is undoubtedly true that the severity of scab in many localities may be traced to the fact that scabby seed has been planted without having previously been treated. This neglect on the part of the grower has resulted in the introduction of the scab organism in the soil, which, together with the fact that in many cases lime has been applied and potatoes have been grown year after year on the same land, accounts for the present situation. Where the scab organism is not present in the soil, precautions should be taken to prevent its entrance, and this is best accomplished by seed treatment.

Where the organism causing scab is already present in the soil, measures other than seed treatment must be taken for its control. The only methods we have at the present time are the ploughing under of a green cover crop, use of an acid fertilizer and the use of sulfur.

Amount of Scab Determines Success of Treatment

In none of the experiments conducted during the past 3 years has there been

a complete control of scab following the use of sulfur. Our present knowledge indicates that the efficiency of the sulfur treatment is determined to a certain extent by the amount of scab in the crop. In one experiment, conducted in 1920, consisting of 48 plots, the number of clean potatoes varied from none to 100 per cent. Half of each of these plots was treated with 450 pounds of sulfur.

The increase in the number of clean potatoes on those plots where the crop was from 80-100 per cent. clean was only 3.6 per cent. as a result of the sulfur treatment. On the plots having 60-80 per cent. clean there was an increase of 17.2 per cent. clean tubers, for those with 40-50 per cent. clean, an increase of 37.9 per cent., from 20-40 per cent. clean an increase of 40.1 per cent., while those plots having none to 20 per cent. of the crop free from scab showed an increase of 52.2 per cent. in the number of clean potatoes. It is apparent from these figures that where there is only a trace of scab, the use of sulfur would not be advisable, on the other hand, where there is a heavy infection the treatment will be found to pay.

Acid Fertilizer Helps

Where there is only a slight amount of scab, relief might be obtained by plowing under a green cover crop, such as rye. This practice, together with the use of an acid fertilizer, has led to a reduction of scab and in many cases to the production of an entirely clean crop.

Cure Severe Scab With Severe Treatment

Where scab is so severe as to render a large portion of the crop unsalable, it is questionable if plowing under a single green cover crop would result in any appreciable diminution of the trouble. Cases have been noted where this practice has resulted in the control of scab, but a period of years was necessary to accomplish the desired results. Probably the best plan to adopt for a field that has grown severely scabbed pota-

atoes is to give the land over to growing some other crop, including green manures. By doing this, if the soil is not too alkaline, it is probable that in a few years a clean crop of potatoes could be grown. It is true, however, that the scab organism will remain active in the soil for some time. There is one case on record where potatoes grown on land that had not been planted in potatoes for 40 years were quite scabby. By proper rotation, however, and the careful selection of fertilizers, the soil should be made to grow a clean potato crop.

In some sections of New Jersey, it is the common practice to grow potatoes year after year on the same land. Where scab is severe, it is desirable that control measures be adopted that will free the soil from it in the least possible time. Where this condition exists, sulfur, properly used, has given very good control.

What Experiments in 1921 Have Revealed

During the summer of 1921 a number of experiments were conducted, which included both a test of the amounts used and a comparison of inoculated and uninoculated sulfur. This discussion will be restricted to a consideration of the results of 6 experiments with the Irish Cobbler variety, where inoculated and uninoculated sulfur was used at the rate of 600 pounds per acre.

In every case the sulfur applications led to a decrease in the number of unsalable potatoes, with a corresponding increase in the number of clean potatoes. The average number of clean tubers on the untreated plots was 8.9 per cent. as compared with 33.5 per cent. on the plots receiving 600 pounds of uninoculated sulfur and 50.9 per cent. for those treated with a similar amount of inoculated sulfur. On the check plots 68.7 per cent. of the crop was unsalable as compared with 30.5 per cent. and 20.3 per cent. for the plots treated with uninoculated and inoculated sulfur respectively.

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Inoculated Comes In Ahead

In 3 of the tests conducted in 1921 both inoculated and uninoculated sulfur were applied at the rate of 300 and 600 pounds per acre. The average of these three tests showed that a 300 pound application of inoculated sulfur gave better control of scab than 600 pounds of uninoculated sulfur. The former treatment showed an average reduction of 45.7 per cent. in the number of unsalable potatoes, as compared with a reduction of 39.2 per cent. where the 600 pound application of uninoculated sulfur was made.

It is apparent from these figures that the inoculated sulfur has given better control of scab than the uninoculated. While in some cases the difference was not great, in others there was a consid-

erable increase in the number of clean tubers, amounting to 36.1 per cent. in one experiment. The difference in price between inoculated and uninoculated sulfur should not be great so that even in the case of the smallest increase noted in the six tests the use of the inoculated sulfur was advisable, while in those cases where there was a marked difference in the number of clean tubers its use more than repaid the extra cost of this material. An additional factor in favor of the use of inoculated sulfur is that it takes less of this material than of the uninoculated to secure the same results.

What is Right Amount to Apply?

With occasional exceptions, it is questionable if sulfur should be used in amounts exceeding 600 pounds. Where scab has been severe and the soil is fairly heavy, this amount should not result in injury. On the lighter soil types of South Jersey the application should probably be reduced to 400 pounds or even less.

The amount of sulfur to be applied can be determined to a large extent by the amount of scab in the previous potato crop. Where a large portion of the crop was unsalable, 600 pounds on the heavier soils should not prove excessive. Where only a small part of the crop is unsalable, the application should be reduced to 300 pounds. Very frequently certain parts of a field grow scabby potatoes, while the crop in the remainder of the field grows clean tubers. Where this condition exists, only the portions of the field growing scabby tubers should be treated, not the entire field.

How and When to Apply

The results of our experiments with sulfur for the control of scab indicate that the best time to apply the sulfur is in the spring, just before the crop is planted. To insure uniform distribution, the sulfur should be broadcasted with a lime distributor just after the land is plowed and before it is harrowed.

Mixing sulfur with the fertilizer, while probably the easiest way to apply it is not satisfactory, since when a quantity of sulfur sufficient to control scab is used, there is a considerable reduction in yield. At the same time the reduction in the number of scabby tubers is not as great as where the sulfur is broadcasted. In an experiment conducted in 1921 the addition of 100 pounds

of sulfur to the fertilizer used led to a slight increase in yield, but gave very little control of scab. When the amount of sulfur in the fertilizer was increased to 300 pounds there was a reduction of 27 bushels in yield, with only 24 per cent. of the crop clean, as compared with 48 per cent. on adjoining plots where 300 pounds of sulphur was broadcasted.

To Summarize

1. The present abundance of scab in the state has resulted from planting untreated scabby seed and in some sections the use of manure from stock fed on scabby tubers. Where scab is not present in the soil, its introduction should be avoided by planting clean seed or seed that has been treated with corrosive sublimate or formaldehyde.
2. Where there is only a slight amount of scab in the soil, plowing under green manures and the use of acid fertilizers should tend to reduce the trouble.
3. Where a large portion of the crop is unsalable scabby and the farm practice permits, the land should be devoted to growing other crops for a period of years. During this time, the land should be managed in such a way as to promote conditions that will inhibit the activities of the scab organism. This may be accomplished to a large extent by plowing under green manures, and by the proper choice of fertilizers.
4. Where a large portion of the crop is unsalable and it is necessary to plant the land in potatoes the following year, sulfur has given good results in the control of scab.
5. As the result of a number of experiments the superiority of inoculated sulfur has been demonstrated. The inoculated sulfur not only has given better control of scab, but the indications are that smaller amounts of the inoculated than of the uninoculated may be used to obtain the same results.
6. If restricted areas in the field grow scabby potatoes, sulfur these spots, not the entire field.
7. Where a large portion of the crop is unsalable, 600 pounds of sulfur on a medium to heavy soil should give good control of scab and have little if any injurious effect.
8. Where only a portion of the crop is unsalable, the amount should be reduced to 300 pounds.
9. On the lighter soils, it is questionable if more than 400 pounds of sulfur should be applied.
10. Do not mix sulfur with the fertilizer or apply in the row.
11. The sulfur should be broadcasted with a lime distributor just after the land is plowed and should then be thoroughly harrowed in. In some cases the failure of sulfur to give results may be traced directly to the fact that the application was not made at the proper time.

SB 211
P 846

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 3, No. 1

NEW BRUNSWICK, N. J.

MAY 20 1932
May 1922

Shipping Point Inspection Has Been Established for New Jersey Potatoes

By A. L. CLARK

When Mr. Hoover, as Federal Food Administrator, caused all potatoes to be graded and sold in accordance with certain definite grade requirements, it was generally considered a step in the right direction. While some growers in different states believed it was too drastic a measure to put into effect all at once, and some growers doubted the practicability of commercially grading potatoes by the same rules in all parts of the country, the edict was on the whole cheerfully complied with.

After the first year's trial, however, growers realized that inspection at the receiving end was not enough, and gradually a desire was voiced for inspection and certification at the shipping end. Some states took hold of this problem right where the Food Administration left off and experimented along several lines in an effort to place on the market potatoes of guaranteed quality. In New Jersey authority to do this was given the State Department of Agriculture by the legislature in 1921. It is a permissive law entirely. Last year several organizations and individuals requested the service of the Department, and some preparation was made; but the crop turned out to be of such poor quality that nothing was done. This year the Garden State Co-operative Potato Association and the Monmouth County Farmers' Co-operative Association have made requests for the service.

Best Methods Used

The methods of carrying out this work are in accordance with the ideas of the

U. S. Department of Agriculture and many of the state marketing agencies. The National Association of State Marketing Officials has been studying this problem with the men in the Federal Bureau of Markets, and, as the writer served as chairman of the national committee on standard grades, the New Jersey Bureau has had the benefit of all the experience and study in the country.

In preparing ourselves, we selected Douglas S. Dilts, a graduate of Cornell in the class of 1917, to take charge. For over two years Mr. Dilts has worked in close touch with the Federal Bureau and has kept posted on the successes and failures in the work done in other states. Several months have been spent by him in the large receiving markets of New York, Philadelphia, Chicago and other cities with Federal Bureau men. The New Jersey Bureau has recently selected to act as inspector this season, some twelve or fifteen assistants, who will be given a very concentrated course in preparation for this work. This training includes a study of potato diseases, accuracy in counting and weighing samples, thoroughness in taking composite samples, etc.

Standard Grades Established

Under the law the State Department has established standard grades for white potatoes, and these assistants will inspect all potatoes as they are being loaded into the cars at shipping stations and write out a certificate stating just how the contents of each car compares

to the state grades. One carload may, for instance, comply with requirements for No. 1 grade, with two and one-half per cent under size and four per cent scab. Another carload might be certified to as containing 8 per cent under size, in all other requirements complying with No. 1 grade, while still another carload might show No. 1 requirements in everything excepting that it ran 40 per cent round stock and 60 per cent long stock.

Will Serve As Guarantee

There are many other details which a certificate will show. The object of the work is to give the seller a true authorized statement of the character of the goods so that he in turn can describe them accurately to prospective buyers. Goods described accurately stay sold. The certificate describing the character of the potatoes will be signed by the inspector as a representative of the New Jersey State Department of Agriculture, and according to the law is *prima facie* evidence in any New Jersey state court. It is in reality a guarantee by the State of New Jersey. A copy of the certificate will be placed in the car, a copy given to the shipper and a third copy filed in the office of the Bureau.

Cases may occur where a receiving point inspection reverses the findings of the shipping point inspection. Those who attended the marketing session in Trenton during "Agricultural Week" will remember that Mr. Foster, who has charge of the statewide mandatory inspection service in Wisconsin, said that out of the first 4,000 carloads shipped there were 12 reversals of inspection certificates. There will still be railroad wrecks, delays and other causes of decay and loss, but though there will certainly be some mistakes made by the inspectors, we are of the opinion that the service will cut down some of the uncertainties and adjustment losses which have been so heavy in recent years. Confidence is of basic importance in merchandising, and it is believed that this service offers the best means of creat-

ing and maintaining confidence between sellers and buyers.

Small Fee Charged

The state can do this work only on a cost basis, therefore a fee of around two and a half to three dollars per car will be charged by the state to maintain the service. It is planned to change the inspectors around frequently, and competent supervision will be provided to keep the force of inspectors performing uniform and efficient service at all times.

Under the provisions of the Federal Appropriation Act the U. S. Department of Agriculture is authorized to perform similar service with a rather limited fund at its disposal. The New Jersey Bureau of Markets has been in constant touch with the Federal Bureau, and we believe at this writing that the New Jersey inspection service will have the co-operation of the federal government.

Report 1922 Acreage From This and Other States

In response to a number of inquiries from the growers, an attempt has been made to obtain some idea of the potato acreage in New Jersey. Letters of inquiry were sent out to growers in each of the important potato-growing counties of the state. The replies received are printed here.

An attempt was made at the same time to obtain some information covering the acreage in other potato-growing sections. The reports to date indicate a proposed increase in the acreage of potatoes in the northern tier of states. There is the possibility that the expected plantings will shrink somewhat, but with a normal season and yield there is likely to be a large crop, with the possibility of over production.

In view of this fact, it is important that the New Jersey growers give some thought to the proper marketing of their crop. The article on shipping point inspection in this issue by A. L. Clark

Hints to Potato Growers

Published monthly by State Potato Association

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should be of considerable interest in this connection.

PRINCE EDWARD ISLAND—W. BOULTER.

"I should judge that we shall have under field inspection this year approximately 1500 acres of Irish Cobblers and 3000 acres of Green Mountains. The total of these varieties may reach 6000 acres. From this acreage we draw the seed stock. The total acreage of all varieties will probably amount to 36,000 acres."

MAINE—E. L. NEWDICK.

"There is every reason to believe that Maine will have a normal acreage this year."

VIRGINIA—T. C. JOHNSON.

"The acreage of potatoes in both the Norfolk and Eastern Shore sections is

fully up to the standard. The late frosts in April did a very slight amount of damage to potatoes in the Norfolk section. I would estimate not more than 1 per cent. Of course the cold weather has delayed development to some extent. There are a number of potatoes now showing well developed blossoms. This would indicate that shipments may be expected to start about the first of June with full shipment one week or 10 days later. The stand throughout the Norfolk region is good. The stand in the Northern part of the North Carolina region is not so good as could be desired. A great many of these potatoes are handled through the port of Norfolk, and are known as Norfolk potatoes. This would indicate that early Norfolk shipments will probably not be so rapid, but that later shipments will come rather strong."

The Eastern Shore section has suffered somewhat more from frosts than has the Norfolk section. Here I suppose the potatoes have been injured possibly five to ten per cent. The acreage in those counties is fully up to the standard, being possibly a little larger than last year. I make this statement based on the amount of fertilizer purchased by the farmers."

NEW YORK—J. M. HURLY.

"Our seed potato growers do not plant until around June 1, but I anticipate our acreage under inspection will be at least 1300 acres. Indications point to considerable increase in the acreage of cobbles and other early varieties under inspection. We also anticipate about a 25 per cent increase in the Giant acreage under inspection."

NEW YORK—L. J. STEELE.

"Two separate investigations were made in the state, one by the Bureau of Markets, the other by the State Potato Association. The average of the replies show an increase of 14.4 per cent for the proposed 1922 acreage over that of 1921 and 16.4 per cent over the 1920 acreage."

LONG ISLAND—F. O. UNDERWOOD.

"The approximate acreage in Nassau County is from 11,000 to 12,000 acres. Crop estimates from Ithaca report a normal to three per cent increase in acreage for Long Island. Practically all of the crop is planted and many fields are coming up."

LONG ISLAND—C. R. INGLEE.

"The reports vary somewhat but indicate an expected increase in acreage in all sections of the state. The 20 growers who reported from Suffolk County expect to grow 9 per cent more than they grew last year, but comments from that heavy-producing section indicate that an average increase of only about 3 per cent is expected."

NEW JERSEY

MONMOUTH COUNTY — JONES. CROSS, DOUGLASS.

"Not much change in acreage this season. Some farms have reduced their acreage, but most all around here are planting about the same as last year. They are coming up well."

BURLINGTON COUNTY—

"Acreage normal." (Black, Clemmer.)

MERCER COUNTY—

"Apparently the increase in acreage in Mercer County is from 12 to 15 per cent over that of last year. A careful estimate of the planting in an area extending over a radius of 5 miles from Hightstown shows about 15 per cent on last year, or 10 per cent over normal." (Danser.)

"Acreage planted shows 10 per cent increase over normal. (Probasco, Gardner, McLean.)

MIDDLESEX COUNTY—O. G. BOWEN.

"Acreage planted shows increase of about 8 per cent over 1921."

SALEM COUNTY—

"Acreage in vicinity of Elmer increased 5 to 10 per cent with a good stand." (Kandle.)

"About 10,000 acres planted." (Crissey.)

"Acreage for 1922 about 20 per cent above normal." (Borton.)

CUMBERLAND COUNTY—

"Acreage in Cumberland County shows increase of 25 per cent. Coming through well." (Minch.)

FROM THE BUREAU OF MARKETS AND CROP ESTIMATES JUNE 19, 1922

State	Acreage		Yield per Acre		Production	
	Harvested 1921	Planted 1922	Average 1921	Indicated 1922	Harvested 1921	Forecast 1922
	Acres	Acres	Bbls.	Bbls.	Cars	Cars
Alabama ...	4,000	11,700	40	38	800	2,223
Florida	16,600	28,200	36	35	2,988	4,935
N. Carolina.	17,700	17,600	45	40	3,982	3,520
S. Carolina.	8,700	18,900	60	50	2,610	4,725
Virginia ...	93,600	98,200	45	40	21,060	19,640

SB 211
P. 416

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 3, No. 2 NEW BRUNSWICK, N. J. MAY 30 1922

PROGRAM—POTATO TOUR

NEW JERSEY STATE POTATO ASSOCIATION
in cooperation with
MONMOUTH, MERCER AND MIDDLESEX COUNTIES
JUNE 22-23, 1922

The above dates promise to be big days for the potato growers of central New Jersey. On these dates the New Jersey State Potato Association, in co-operation with the County Boards of Agriculture of Monmouth, Mercer and Middlesex Counties, plans to conduct an

auto tour to examine the various demonstrations being conducted in these three counties by the County Agents and the Experiment Station.

to meet all trains so that out of state visitors who cannot get to Trenton in time to start with the tour can join the tour here.

Thursday night will be spent at Hightstown where an attractive program has been arranged. Friday will be spent in Monmouth County.

See For Yourself Where the Good Seed Grows

The New Jersey growers have long realized the value of good seed, and for a number of years seed source demonstrations have been conducted in Monmouth, Mercer and Middlesex Counties. The results of these tests have led many of the growers to purchase certified seed as a solution of their seed problems. This year extensive tests are being conducted, and the local growers are anxious to examine them with the seed growers. For this reason a two-day tour has been planned. Every seed potato farmer and everyone else who is interested in potato growing, is invited to come and "be shown."

Leaving Hightstown at 9 o'clock the tour will proceed to Freehold where the first stop will be made at the Frank Jones farm. Those visitors and local growers who cannot be present Thursday can meet here for the run through Monmouth County.

The Committee on Arrangements invites all interested in potato growing to be present on these two days. If you contemplate attending advise W.

The tour will start from the Stacey - Trent, Trenton, at 9.30 A. M., daylight saving time, on Thursday, June 22. The first stop will be at the Earl Dilatush Farm, near Robbinsville. It will probably be more convenient for the local growers to meet at this point. After several stops in Mercer and Middlesex counties the tour will reach the Walker-Gordon farm at Plainsboro at 1 o'clock where lunch will be served. Plainsboro is near Princeton Junction on the main line between New York and Philadelphia. Arrangements have been made

H. Martin, New Jersey Agricultural Experiment Station, New Brunswick, N. J., stating whether or not you are bringing your own car, so that auto accommodations may be provided for those who have no means of transportation.

PROGRAM

Thursday, June 22

Tour of Mercer and Middlesex Counties

(Daylight saving time)

- 9:30 A.M.—Leave Trenton. Stacy-Trent Hotel. Visit the following places.
- 10:00-10:40 A. M.—(1) Seed source test. Treated and untreated seed, mature vs. unmatore seed on Earl Dilatush farm, Robinsville.
- 11:10-11:40 A. M.—(2) Seed source test on farm of F. W. Conover, Dutch Neck.
- 11:50-12:15 P. M.—(3) Fertilizer, sulfur, dusting, and modern potato cultivation methods, farm of Charles Dey.
- 12:25-12:50 P. M.—(4) Seed source test at farm of Fred Carlson, Cranbury.
- 1:00-2:30 P. M.—(5) Lunch at the Walker-Gordon Farms, Plainsboro. Seed source test. A chance will be given for visitors to inspect the farm.
- 2:35-2:55 P. M.—(6) Inspect modern seed potato storage on the farm of Arthur E. Perrine, Prospect Plains.
- 3:00-4:00 P. M.—(7) Seed source test and inspection of the plant of the Forsgate Farms, Jamesburg.
- 4:30-5:15 P. M.—(8) Inspect seed source and fertilizer test carried on by the U. S. Department of Agriculture and the N. J. Agricultural Experiment Station in co-operation with the Mercer County Farm Bureau, at the farm of C. L. Conover, Hightstown.
- 5:20-5:45 P. M.—(9) Fertilizer test on farm of A. G. Conover.
- 8:00 P. M.—Evening meeting at Hightstown. Program to be announced later.

Friday, June 23

Tour of Monmouth County

9:00 A. M.—Leave Hightstown.

9:45-10:30 A. M.—(10) Inspect fertilizer test carried on by U. S. Department of Agriculture and the N. J. Agricultural Experiment Station in co-operation with the Monmouth County Board of Agriculture on farm of Frank Jones, Freehold. Monmouth County growers can join the tour at this point.

10:45-11:45 A. M.—(11) Inspect seed source, spraying, dusting and tuber unit tests carried on by the N. J. Agricultural Experiment Station and the Monmouth County Farm Bureau on farm of Isaac B. Van Derveer, Freehold.

12:15-2:15 P. M.—(12) Lunch at the Henry Cross farm, Holmdel. Inspect variety and fertilizer tests conducted by the U. S. Department of Agriculture and the N. J. Agricultural Experiment Station in co-operation with the Monmouth County Farm Bureau. Discussion of seed potato problems and observations of the day.

2:45-3:15 P. M.—(13) Inspect seed source tests on farm of J. Holmes and Carney, Holmdel.

Auto tour through Colts Neck, Freehold, West Freehold. Returning to Freehold allowing visitors to get train for New York, Philadelphia or seashore points.

COMMITTEE ON ARRANGEMENTS

Monmouth Co.—E. Douglass, Frank Jones, Stanley DuBois.

Middlesex Co.—O. G. Bowen, R. E. Colyer, George Davison.

Mercer Co.—H. C. McLean, C. B. Probasco, Fred Gardner.

State Potato Association—W. H. Martin.

(1) SEED SOURCE TEST*Earl Dilatush, Robbinsville*

Planted April 14

Fertilizer 2200 lbs. 4-8-5

Irish Cobblers

Row	Source	Grower
1- 2	Me.	Ray. D. Hews
3- 4	Va.	Martin Hall
5- 6	Vermont	E. S. Brigham
7	N. J. (Cer.)..	J. G. Borton
8	Me. (Cer.)....	W. F. Woodman
9	Prince Edward Island	
10	Vermont	E. S. Brigham
11-12	N. J.	Minch Brothers
13-14	N. J. (Cer.)..	Coleson Est.
15-16	Vermont	E. S. Brigham

Green Mountains

17	N. Y. (Cer.)..	C. R. Alexander
18	Wisconsin ...	Miller Bros.
19	N. Y.	Granby Seed Asso.
20	N. Y.	W. J. Wheeler
21	Prince Edward Island No. 1.	
22	N. Y.	Arthur Reeves
23	N. Y.	C. R. Alexander
24	Wisconsin	Miller Bros.
25	N. J. (Nor- cross)	J. H. Kandle
26	Prince Edward Island No. 2.	
27	Me. (Cer.) ...	N. H. Rich
28	Me. (Non- Cer.)	
29	N. Y.	C. R. Alexander

American Giants

30	N. J.	W. Padget
31	Prince Edward Island	
32	N. Y. (Cer.)..	H. F. Reed & Son
33	N. Y. (Cer.)..	G. W. White & Sons
34	N. J.	J. F. Errickson
35	N. J.	W. Padget
36	N. Y.	L. J. Wilson
37	N. J.	Minch Brothers
38	Va.	F. B. Bell
39	Penn.	Harry Smith
40-41	Check	W. Padget

1a. Treated vs. untreated seed, matured
vs. immatured seed, (see stakes in field).

(2) SEED SOURCE TEST*F. W. Conover, Dutch Neck*

Planted April 11

Fertilizer 1600 lbs. 5-10-8

Green Mountains

Row	Source	Grower
1	Me. (Cer.) ...	N. H. Rich
2	N. Y. (Cer.)..	Granby Seed Asso.
3	Prince Edward Island No. 1.	
4	N. Y.	C. R. Alexander
5	N. Y. (Cer.)..	
6	N. J. (Nor- cross)	J. H. Kandle
7	Wis.	Miller Bros.
8	N. Y. (Cer.) Franklin Co.	
9	N. Y. (Cer.)	A. Reeves
10	Maine (Cer.)..	N. H. Rich
11	Maine (Non- Cer.)	
12	Prince Edward Isle No. 2 ..	
13	Maine (Cer.)..	N. H. Rich

Irish Cobblers

14	Prince Edward Isle	
15	N. J. (Cer.)..	J. G. Borton
16	Maine (Cer.)..	W. F. Woodman
17	N. J. (Cer.)..	Coleson Est.
18-19	Check (Wilson Giants)	
20-21	N. J.	Minch Bros.
22	N. J. (Cer.)..	David McKay
23	Va.	Martin Hall
24	N. Y. (Wilson Giants)	

American Giants

25	N. J. (Cer.)..	J. F. Erreckson
26	N. Y. (Cer.)..	G. W. White & Son
27	Va.	F. B. Bell
28	N. Y.	L. J. Wilson
29	Prince Edward Isle	
30	N. Y. (Cer.)..	H. R. Reed & Son
31	N. Y.	L. J. Wilson
32-33	N. J.	Minch Bros.
34	N. Y.	L. J. Wilson

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(4) SEED SOURCE TEST

Fred Carlson, Cranbury

Planted April 13

Fertilizer 2000 lbs.

Irish Cobblers

Row	Source	Grower
1	Prince Edward Island	
2	Me.	
3	Me.	W. F. Wood
4	N. J.	Coleson Est.
5	N. J.	J. G. Borton
6	N. Y. (Giants) Wilson	
7	N. J.	Fred Carlson
8	N. J.	Minch Brothers
9	Va.	Martin Hall
<i>Green Mountains</i>		
10	Prince Edward Island No. 1.	
11	Prince Edward Island No. 2.	

12	N. Y. (Giants, Wilson)
13	New Hampshire
14	N. Y.
15	N. H.
16	N. Y.
17	N. Y. (Giants, Wilson)
18	N. Y.
19	N. J. (Nor-cross)
20-21	Me., Gr. Mts. (com. seed).

American Giants

22	Me.
23	N. Y.
24	N. Y.
25	N. Y.
26	N. Y.
27	N. J.
28	Va.

(7) SEED SOURCE TEST

Forsgate Farm, Jamesburg

Planted April 10th

Fertilizer 2000 lbs.

Irish Cobblers

Row	Source	Grower
1	Prince Edward Isle	
2	Me.	W. E. Wood
3	N. J. (Nor-cross)	J. H. Kandle
4	N. J. (Home grown seed).	
5	N. J. (Cer.)..	Coleson Est.
6	N. J. (Cer.)..	J. G. Borton
7	N. J. (Home grown seed).	
8	N. J. (Cer.)..	Minch Bros.
9	Me. (Non Cer.)	

Green Mountains

10	Vermont
11	Prince Edward Isle No. 1 ..
12	Prince Edward Isle No. 2 ..
13	N. H.
14	Vermont

15	N. H.Hill
16	N. Y.W. J. Wheeler
17	Wis.F. Farms
18	Vermont
19	Me. (Cer.) ...
20	N. Y.C. R. Alexander
21	N. Y.Arthur Reeve
22	Vermont

American Giants

23	Me.
24	Prince Edward Isle
25	N. Y. (Cer.)..H. R. Reid
26	N. Y. (Cer.)..G. W. White
27	Me.
28	N. Y.L. J. Wilson
29	Va.F. B. Bell
30	N. J.Minch Bros.
31	Me.

(8) SEED SOURCE TEST

Clifford L. Conover, Hightstown

Planted April 5th

Fertilizer 1800 lbs. 4-8-5

American Giants

Row	Source	Grower
1- 2	Me. (Black Fox)	McIver
3- 4	N. J. (Cer.)	J. F. Erreckson
5- 6	N. Y. (Cer.)	H. R. Reed & Sons
7- 8	N. J. (Cer.)	Minch Bros.
9-10	Me. (Black Fox)	McIver
13-14	N. Y.	L. J. Wilson
15-16	Prince Edward Isle	
17-18	Check (Black Fox)	McIver

Irish Cobblers

19	N. J.
20	Prince Edward Isle
21	N. J. (Nor- cross)J. H. Kandle
22	Me. (Cer.) ...W. F. Woodman
23	N. J.
24	N. J. (Cer.) ..Coleson Est.
25	N. J. (Cer.)..Minch Bros.
26	N. J. (Cer.)..J. G. Borton
27	N. J.

Green Mountains

28	N. Y. (Cer.)..Wheeler
29	Me. (Cer.) ...Rich
30	N. Y. (Cer.)..A. Reeves
31	Check, N. Y...
32	N. Y. (Cer.)..C. R. Alexander
33	Prince Edward Isle No. 2...
34	Prince Edward Isle No. 1
35	Check, N. Y. ..
36	N. Y. (Cer.)..Granby Seed Assoc.
37	Wis.Miller Bros.
38-9	Blush (home seed)
40	Check, N. Y...

(8a) Fertilizer Ratios and Fertilizer Experiment.

The fertilizer mixtures included in this experiment are almost identical with those in the experiment at the Frank Jones farm (10). Any differences in arrangement of the plots will be explained in the field.

(10) FERTILIZER RATIO AND FERTILIZER EXPERIMENT

Frank Jones Farm

Planted April 4

Row	Formula	Row	Source of Ammonia
1- 2	2-16- 2	50- 51	Nitrate of Soda
3- 4	2-14- 4	52- 53	Sulphate of Ammonia
5- 6	4-14- 2	54- 55	⅓ Nitrate, ⅔ Sulphate
7	Check	56- 57	⅔ Nitrate, ⅓ Sulphate
8- 9	2-12- 6	58- 59	¼ Nitrate, ½ Sulphate, ½ Dried blood
10-11	4-12- 4	60- 61	¼ Nitrate, ½ Sulphate, ½ Fish Scrap
12-13	6-12- 2	62- 63	¼ Nitrate, ½ Sulphate, ½ Tankage
14	Check	64- 65	¼ Nitrate, ½ Sulphate, ½ C. S. meal

15-16	2-10-8	66-67	¼ Nitrate, ½ Sulphate, 5/16 C. S. meal
17-18	4-10-6	68-69 (3%)	¼ Nitrate, ½ Sulphate, ½ Dried Blood
19-20	6-10-4	70-71 (5%)	¼ Nitrate, ½ Sulphate, ½ Dried Blood
21	Check	72-73 (6%)	¼ Nitrate, ½ Sulphate, ½ Dried Blood

22-23 8-10-2

24-25 2-8-10

26-27 4-8-8

28 Check

29-30 6-8-6

31-32 8-8-4

33-34 10-8-2

35 Check

36-37 2-6-12

38-39 4-6-10

40-41 6-6-8

42 Check

43-44 8-6-6

45-46 10-6-4

47-48 12-6-2

49 Check

Potash Materials Experiments

4-8-0

4-8-3 Sulphate of Potash

4-8-5 Sulphate of Potash

4-8-7 Sulphate of Potash

4-8-0 Sulphate of Potash

4-8-3 Nebraska Salts

2-8-5 Nebraska Salts

4-8-7 Nebraska Salts

4-8-0 Nebraska Salts

4-8-3 Muriate of Potash

4-8-5 Muriate of Potash

4-8-7 Muriate of Potash

Quantity per acre

4-8-5 900 lbs.

4-8-5 1200 lbs.

4-8-5 1500 lbs.

4-8-5 1800 lbs.

4-8-5 2100 lbs.

(11) SEED SOURCE TEST

I. B. Van Derveer, Freehold

Planted

Fertilizer

Irish Cobblers

Row	Source	Grower
3	N. J.	Minch Brothers
4	N. J.	J. G. Borton
5	N. J.	Coleson Est.
6	N. J.	Minch Brothers
7	Va.	Martin Hall
8	N. J.	Minch Brothers
9	Me.	W. F. Woodman
10	Prince Edward Island	
11	Canada	
12	Canada	
13	Me.	R. D. Hews
14	N. J.	Minch Brothers

American Giants

15	N. J.	Minch Brothers
16	Va.	I. B. Bell
17	N. J.	Minch Brothers
18	N. Y.	H. F. Reid
19	Prince Edward Isle	
20	N. J.	Minch Brothers

21	N. Y.	E. E. Hulst
22	N. Y.	L. J. Wilson
23	Me.	Beal's
24	N. Y.	Rough Riders
25	N. J.	Minch Brothers

Green Mountains

26	N. H.	C. F. White
27	N. Y. (Giants).	G. W. White & Sons
30	N. J. (Giants).	Minch Brothers
31	Mills Prize ...	
32	Me. (Mts.) ...	N. H. Rich
33	N. Y. (Mts.)	G. R. Alexander
34	N. Y. (Mts.)	W. J. Wheeler
35	N. Y. (Mts.)	A. Reeves
36	Me. (Mills Prize)	
37	N. H. (Mts.)	E. G. Huckins
38	N. J. (Nor- cross)	J. H. Kandle
39	Me. (Mills Prize)	
40	N. Y. (Mts.)	F. E. Hulst

11a. Spraying with home made Bordeaux mixture vs. dusting with copper lime dusts for the control of foliage diseases. Spraying vs. dusting with tobacco extract for the control of lice. (See stakes in field.)

(12) FERTILIZER RATIO EXPERIMENT

Theron McCampbell Farm

Planted April 3

Row	Formula $\text{NH}_3\text{—P}_2\text{O}_5\text{—K}_2\text{O}$
1—2	2—16—2
3—4	2—14—4
5—6	4—14—2
7	Check
8—9	2—12—6
10—11	4—12—4
12—13	6—12—2
14	Check
15—16	2—10—8
17—18	4—10—6
19—20	6—10—4
21	Check
22—23	8—10—2
24—25	2—8—10
26—27	4—8—8
28	Check
29—30	6—8—6
31—32	8—8—4
33—34	10—8—2
35	Check
36—37	2—6—12
38—39	4—6—10
40—41	6—6—8
42	Check
43—44	8—6—6
45—46	10—6—4
47—48	12—6—2
49	Check
Source of NH_3	
$\frac{1}{3}$ Nitrate of Soda	
$\frac{1}{3}$ Sulphate of Ammonia	
$\frac{1}{3}$ Dried Blood	

(12a) VARIETY TEST

Theron McCampbell Farm

Planted April 11

Rows 1—10	Seedlings
" 11	Irish Cobbler
" 11a	Burbank
" 12	Triumph
" 12a	Green Mountain
" 13	Early Harvest
" 13a	Gold Coin
" 14	Spaulding No. 4 (Rose No. 4)

- " 14a State of Main
" 15 Brown Beauty
" 15a Rural New Yorker No. 2
" 16 Charles Rowning
" 16a Sir Walter Raleigh
" 17 Early Ohio
" 17a Russet Rural

(13) SEED SOURCE TEST

Holmes and Carney, Holmdel

Planted April 11

Fertilizer 1300 lbs. 4-8-7

American Giants

Row	Source	Grower
30	Local	Holmes & Carney
31	Me.	Mon. Co. Exc.
32	Me.	Beal's
33	N. Y.	G. W. White & Sons
34	N. J.	Minch Brothers
35	N. J.	Minch Brothers
36	N. Y.	L. J. Wilson
37	Prince Edward Island	
38	N. J.	Minch Brothers
39	N. Y.	H. F. Reid
40	Va.	I. B. Bell
41	N. J.	Minch Brothers
42	N. J. (Nor-cross)	J. H. Kandle
43	N. J. (Giants)	Minch Brothers

Irish Cobblers

45	Canada	
46	N. J.	Minch Brothers
47	Me.	W. F. Woodman
48	Prince Edward Island	
49	N. J.	Coleson Est.
50	Canada	
51	N. J.	J. G. Borton
52	Va.	Martin Hall
53	Me.	R. O. Hews
54	Mills Prize	

Green Mountains

55	Me.	N. H. Rich
56	N. Y.	G. R. Alexander
57	N. Y.	W. J. Wheeler
58	N. H.	G. F. White
59	N. Y.	E. G. Huckins
60	N. Y.	A. Reeves
61	Me. (Mills Prize)	Farmers' Exc.

SB211
P8H6

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 4, No. 9

NEW BRUNSWICK, N. J.

January, 1932

Sources of Ammonia in Potato Fertilizer

By J. G. LIPMAN

The purchaser of commercial fertilizers is, naturally, interested in informing himself concerning the source of ammonia in different fertilizers. His interest in the question is stimulated by the knowledge that ammonia from different sources may vary in cost and in efficiency. It is known, further, that some carriers of ammonia can be used with greater safety than others and that these carriers have an influence on the mechanical condition of the fertilizer mixtures. Furthermore, the potato grower is especially anxious to know whether the carrier of ammonia will tend to make his soil more or less acid and in that way favor or discourage the development of potato scab.

Ammonia in mixer fertilizers is derived from three sources, generally classed as nitrates, ammonium salts and organic matter. In the first group we include nitrate of soda (which is produced in Chile and Bolivia), and nitrate of potash (available in relatively small amounts from Chile and East India). Small amounts of nitrate of lime and nitrate of ammonia may also be made available to the fertilizer trade by manufacturers of these chemicals in Scandinavia. For practical purposes nitrate of soda is the sole important source of ammonia derived from nitrates. The ammonium salts in mixed fertilizers may be derived from sulfate of ammonia, a by-product in the making of coke and illuminating gas, or from muriate of ammonia, phosphate of ammonia and nitrate of ammonia. The first of these is the most important source of am-

monia, the others are still quite unimportant. In the course of time, however, the improvements in the manufacturing of so-called air nitrates may make muriate and phosphate of ammonia important sources of supply for this ingredient in mixed fertilizers. Aside from the materials just mentioned, so-called base goods are a very important source of supply of ammonia in mixed fertilizers. Base goods are made by mixing ground phosphate rock with relatively low-grade and insoluble carriers of ammonia, such as leather scrap, and hair and wool waste. When such mixtures are treated with strong sulfuric acid the resulting product is an acid phosphate that contains more or less ammonia. In the fertilizer trade this is known as base goods. Large quantities of insoluble nitrogenous products are thus converted into readily available ammonium compounds. The organic carriers of ammonia include tankage, fish, dried blood, bone meal, horn and hoof meal, cottonseed meal, castor pomace and a number of other products of animal and vegetable origin. Of late years, the supply of these organic carriers of ammonia has been less abundant for fertilizer purposes because tankage, dried blood, and high-grade fish are utilized for the feeding of livestock—particularly poultry and hogs. The livestock feeder can, naturally, pay more for these materials as livestock feeds than he can for them as fertilizers.

A special study of potato fertilizers will show us that they usually contain relatively large proportions of fertilizer

ingredients. In the pre-war days 4:8:10 mixtures, that is, materials containing 4 per cent. of ammonia, 8 per cent. of phosphoric acid and 10 per cent. of potash, were regarded as standard mixtures and were used by potato growers almost universally. In more recent years we have learned to get along with less potash and the more popular brands of potato mixtures contain from 4 to 6 per cent. of ammonia, 6 to 10 per cent. of phosphoric acid and 4 to 7 per cent. of potash. Many of the potato growers in central New Jersey prefer to use 4:8:5 or 5:8:5 mixtures. In southern New Jersey fertilizers containing 5 per cent. of ammonia are frequently called for in preference to those containing only 4 per cent. of ammonia. As a heritage from the pre-war days we also have the tradition that one-third of the ammonia in the potato mixture should be derived from nitrate of soda, one third from sulfate of ammonia and one-third from organic sources. Mixtures of this sort usually give good results. Within the past year or two the whole question of the sources of ammonia in potato mixtures has been considered more thoroughly and more critically. It would be worth while, therefore, to point out certain relations that should be familiar to every potato grower.

The first item to be considered in this connection is that of cost. At prevailing prices, ammonia in sulfate of ammonia costs less per unit than that in nitrates or organic materials. The organic materials are the most expensive source of ammonia—often costing twice as much per unit of ammonia as sulfate of ammonia. When we consider the numerous experiments carried on to determine the relative efficiency of ammonia from different sources, we find that nitrates are most efficient, ammonium salts somewhat less efficient, and animal and vegetable products considerably less efficient than ammonia derived from nitrates. In the experiments carried on by the New Jersey Experiment Station it has been shown that when only one source of

ammonia is used nitrate of soda will produce the largest yields. It has been found, further, that by using different carriers of ammonia, the efficiency of the nitrogen in sulfate of ammonia and animal products is increased—thanks to the presence of nitrogen in the form of nitrates. For example, potato fertilizers in which half of the ammonia is derived from nitrate of soda and half from sulfate of ammonia have given very good returns. Similarly, mixtures in which half of the ammonia was derived from nitrate of soda and half from tankage also gave very good returns. Nevertheless, because of the high cost of ammonia in animal and vegetable products, the amount of these employed in fertilizer mixtures should be reduced to a minimum consistent with satisfactory mechanical condition and safety in the use of the fertilizers.

The factor of safety in the use of fertilizers deserves consideration. There is no fool-proof fertilizer. When large quantities of chemicals are applied in the row, as is done in potato growing, damage may be caused to the seed and a poor stand may result. This is more apt to happen in dry seasons and on the lighter types of soils. Naturally, animal and vegetable carriers of ammonia are safer materials to use than the more concentrated and more soluble chemicals, like nitrate of soda or sulfate of ammonia. Hence, there is often a natural prejudice in favor of animal or vegetable carriers of nitrogen. (The terms nitrogen and ammonia are used here in the same sense, but chemically speaking, they are not the same). From the standpoint of economy it would be practicable to cut out the animal carriers of ammonia entirely and depend on nitrate of soda and sulfate of ammonia as the only sources of this ingredient. In that case, it would be desirable to apply only a portion of the fertilizer in the row and to broadcast the rest, or to use an additional amount as a side dressing. From the point of view of the fertilizer manufacturer it is quite essential that the

fertilizer sold by him should be in a good drillable condition, not only when delivered to the customer, but some weeks later, since deliveries are often made in midwinter. In that case, the presence of tankage or of other animal or vegetable carriers of ammonia is helpful in assuring fertilizer mixtures less likely to harden in the bag and more certain to pass readily through fertilizer distributing machinery.

There is one more point as bearing on the sources of ammonia in potato fertilizers that should receive thoughtful consideration. Potato growers are familiar with the fact that nitrate of soda where used will tend to make the soil less acid, whereas sulfate of ammonia as a carrier of ammonia will tend to make the soil more acid. Because of the prevalence of potato scab in our potato soils, growers are naturally anxious to use only such fertilizer materials as would keep down the development of the potato scab fungus. It is obvious, of course, that where scab is very prevalent and very bad, drastic remedies are needed. In that case the attempt should be made to cure the trouble by the use of sulfur. Sulfate of ammonia, or any other acid fertilizer, cannot be depended upon to eliminate at once the potato scab fungus or to reduce damage by it to a minimum. After the soil has been made acid enough, or where the soil is not acid, acid fertilizers, and particularly sulfate of ammonia, may be of material help in keeping down injury by potato scab. It should not be forgotten, at the same time, that the continued use of sulfate of ammonia, like the continued use of sulfur, will ultimately lead to the accumulation of acidity in the soil to a point where the crop itself will be injured. Hence, it would be preferable to derive a portion of the ammonia in potato mixtures from nitrate of soda and a portion from sulfate of ammonia. The residues from the nitrate would tend to sweeten the soil, while those from the sulfate of ammonia would tend to make it more

acid, and suitable combinations of the two might be made up to prevent the soil from becoming either more acid or more sweet. For most potato growers it would be preferable, in the long run, to derive about one unit of ammonia from nitrate of soda and one to two units from sulfate of ammonia. The rest might be derived from tankage or fish. Where it is desired to increase the acidity of the soil, the larger proportion of sulfate of ammonia in the mixtures would, of course, be desirable.

In conclusion, it may be noted that the amount of acid in the soil is bound to vary from year to year and that any fertilizer practice adopted should be such as to keep the soil acid enough to discourage the growth of the potato scab fungus and yet not acid enough to interfere with the vigorous development of the potato crop.

The Annual Meeting

The officers who directed the activities of the Association during 1923 were re-elected for the present year.

At a meeting of the executive committee it was decided to limit the number of late crop exhibits to 50 from a county in the 1925 show. It will be recalled that a limit of 50 exhibits was placed on the commercial crop this year. It was also decided that in the future the Red Skin and Pink Eye varieties be placed in the commercial group and that a separate class be made for them. In the show next year, four awards will be made in each class in each county rather than two as is now the case.

The Executive Committee decided also that "Hints to Potato Growers" would be sent only to those members who had paid their membership fee of one dollar. The question of increased membership was likewise discussed, the consensus of opinion being that unless more growers became members in the association, it would be necessary to discontinue the publishing of the "Hints."

The program for the meeting was an

Hints to Potato Growers

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WM. H. MARTIN,
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Corresponding Secretary

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OFFICERS:

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Martin, J. Harry Kandle, Theo. B.
Lewis, Charles Oakley, Wm. B. Dur-
yee, Harvey Dey, A. W. Gertzel, Wil-
lard Gardner, Floyd Harris.

excellent one and every potato grower in the state should have a copy of the proceedings of the meeting which will be published in the near future by the state department of agriculture. Copies may be secured by writing the state department at Trenton. The Thursday afternoon session was particularly excellent. At this time local growers discussed various phases of potato growing and the general discussion which followed the presentation of the various papers was without doubt the best part of the meeting.

The crowd on Friday morning was much smaller than that on Thursday. Those who heard Perry and Bemis dis-

cuss seed potato production methods in New York and Michigan were well repaid. Some interesting points were brought out in the discussion of good vs. poor seed potatoes. The plan of conducting an extra half day session proved to be very desirable and will be continued next year.

THE BANQUET

Douglas Dilts of the Bureau of Markets, chairman of the banquet committee, is to be congratulated on the success of the fourth annual banquet of the association. Elmer Wein of Vineland, deserted the chicken men long enough to acquaint the 125 potato growers and their wives with the new potato song, something about "Potatoes all the time." Prof. Alva Agee who acted as toastmaster was presented a gold fountain pen by the members of the Association in recognition of his valuable services to the potato growers of the state. After hearing from Dr. Lipman, J. B. R. Dickey, Fred Jackson, Jack Crissey, and Fred Gardner, the crowd, with the able assistance of the "Can Openers," danced until 11 o'clock.

POTATO SHOW GREAT SUCCESS Salem and Cumberland Win Cups

Under Fred Gardner's able supervision, the 1924 Potato Show was without question the best yet. Despite the fact that the number of commercial crop exhibits was limited to 50 from a county, the total number of exhibits was approximately as large as in 1923. Salem County with Jack Crissey at the helm with 129 exhibits, was far ahead of the nearest competitor. The counties exhibiting, as well as the number of exhibitors, are shown in the following table. For comparative purposes the number of exhibits from each county in previous shows is given.

	1921	1922	1923	1924
Burlington	16	18	8	0
Camden	18	13	37	0
Cape May	0	0	1	43
Cumberland	31	45	88	71
Gloucester	0	0	11	48
Mercer	109	85	66	36
Middlesex	33	16	0	20
Monmouth	27	61	102	57
Salem	68	135	129	129
Somerset	1	1	2	2

Some interesting facts are apparent from this table. Cape May County with one exhibit in 1923 had 43 excellent exhibits in 1924 as the result of the activities of R. E. Reeves and S. E. Stone, teachers of Agriculture in Cape May High Schools. This was their first experience and they promise to come back strong next year. If individual awards were passed out to the county agents for their contribution to the success of the show, one should certainly go to George Lamb, county agent of Gloucester County. This is his first year in the county and yet he was able to increase the number of exhibits from 11 in 1923 to 48 this year.

J. B. R. Dickey, formerly with the experiment station and now in Pennsylvania, judged the show. He was loud in his praises of the excellent quality of the various exhibits and it was only after some hesitancy that he finally awarded the South Jersey Bankers' Cup to Cumberland County for the best exhibit of late crop potatoes. This is the second year Cumberland has won this cup and Fred Jackson has already indicated that he intends keeping it in the county by winning it again next year. Salem County was awarded the Edge Cup for the third year, and as a result, retains permanent possession. The exhibit of late crop potatoes from this county was an excellent one. The Salem County growers are already making plans whereby they will relieve Cumberland County of the late crop cup next year.

THE PRIZE WINNERS

COMMERCIAL CROP

GOLD MEDALS (Best Exhibit in each Class)

- Cobblers—Linwood Patrick, Salem. Giant—Jas. McKnight, Freehold.
- Mountains—John Fortsch, Jamesburg.
- Miscellaneous—John Fortsch, Jamesburg.

SILVER MEDALS (Second Best Exhibit in each class)

- Cobblers—C. E. Moore, Daretown. Giant—E. F. Miller, Freehold.
- Mountains—A. E. & G. C. Snook, Trenton. Miscellaneous, Wilbur Dey, Trenton.

LATE CROP

GOLD MEDALS (Best Exhibit in each class)

- Cobblers—John N. Cordrey, Shiloh.
- Mountains—Frank Ott, Bridgeton.
- Giants—John Coles, Newfield. Miscellaneous—R. L. Scharring - Hausen, Glen Moore.

SILVER MEDALS (Second best exhibit in each class)

- Cobblers—J. C. Crissey, Salem. Mountains—E. Kirby, Mullica Hill.
- Giants—Minch Bros., Bridgeton. Miscellaneous—Allen Ackley, Deerfield.

CAPE MAY COUNTY

Commercial Crop Cobblers

1. Frank Swain..Cape May Court House

Late Crop Cobbler

1. Everett SmithGoshen
2. Wm. Bailey & Sons.....Cold Spring

Commercial Crop Miscellaneous

1. W. H. Powell.....Cape May Court House (Red Skins)
2. W. H. PowellCape May Ct. House (Late Whites)

Late Crop Miscellaneous

1. Leroy ComptonGreen Creek (Superba)
2. Ralph Schellenger & Son.....Green Creek (Spaulding)

GLOUCESTER COUNTY

Commercial Crop Cobbler

1. Clayton KirbyMullica Hill

Late Crop Cobbler

1. Earl SkinnerMullica Hill
2. Wilbert SmithMonroeville

Late Crop Miscellaneous

1. Chas. Colson..Mullica Hill (Superba)
2. Fred Olsen..Franklinville (Red Skin)

CUMBERLAND COUNTY

Commercial Crop Cobbler

1. Emery HetzellDeerfield
2. Allen AckleyDeerfield

Late Crop Cobblers

1. Emery HetzellDeerfield
2. Allen HarrisShiloh

Late Crop Green Mountains

1. R. C. MayVineland
2. Minch BrothersBridgeton

Late Crop Miscellaneous

1. Frank Ott
.....Bridgeton (Rural Russett)
2. W. W. Oley..Bridgeton (Uncle Sams)

Late Crop Giants

1. W. W. Oley.....Bridgeton
2. Frank OttBridgeton

MIDDLESEX COUNTY

Commercial Crop Cobbler

1. Arthur E. Perrine.....Cranbury
2. R. E. ColyerJamesburg

Commercial Crop Green Mountains

1. Arthur ClaytonCranbury
2. Arthur E. Perrine.....Cranbury

Commercial Crop Giants

1. Arthur E. Perrine.....Cranbury
2. Harvey H. Dey.....Hightstown

Commercial Miscellaneous

1. Arthur Perrine....Cranbury (No. 9)
2. C. V. D. Grant
.....Cranbury (Rural Russett)

MERCER COUNTY

Commercial Crop Cobbler

1. R. E. Hulshart.....Robbinsville
2. Fred GardnerYardville

Commercial Crop Green Mountains

1. Earl WetherellRobbinsville
2. James TaylorRobbinsville

Commercial Crop Giants

2. Wm. M. Campbell.....Cranbury

Commercial Crop Miscellaneous

1. Erick Errickson
.....Hopewell (Rural Russett)
2. Criss Hansen
.....Lambertville (Rural Russett)

Late Crop Cobblers

1. A. E. & G. C. Snook.....Trenton
2. Earl Dilatush.....Robbinsville

Late Crop Green Mountains

1. Walter HainesRobbinsville
2. Earl DilatushRobbinsville

MONMOUTH COUNTY

Commercial Crop Cobblers

1. Oscar KetchamFreehold
2. Van Derveer & Samson....Freehold

Commercial Crop Green Mountains

1. Fred PullenCream Ridge
2. James McKnightFreehold

Commercial Crop Giants

1. Van Derveer & Miller.....Freehold
2. Eugene BergeFreehold

Late Crop Cobblers

1. Charles WooleyAllentown
2. Benza BrothersAllentown

Late Crop Green Mountains

1. Charles WooleyAllentown

Late Crop Giants

1. Frank JonesFreehold

ATLANTIC COUNTY

Late Crop Cobbler

1. Henry TappenEgg Harbor

SOMERSET COUNTY

Commercial Crop Cobbler

1. State VillageSkillman

Commercial Crop Green Mountains

1. State VillageSkillman

SALEM COUNTY

Commercial Crop Cobbler

1. H. C. Whitehead.....Salem
2. Martin PattersonMonroeville

Late Crop Cobbler

1. Franklin BishopElmer
2. Samuel HackettQuinton

Late Crop Green Mountains

1. Earl MooreElmer
2. Isaac HeligNorma

Late Crop Miscellaneous

1. J. C. Crissey
.....Salem (Rural Russett)
2. J. B. Dunn.....Salem (Red Skin)

Ten Years of Potato Spraying

The year 1922 marked the close of ten years of potato spraying in New Jersey. During this time twenty-three spraying experiments have been conducted in which the Irish Cobbler variety was sprayed with home-made Bordeaux mixture, of these nineteen resulted in increased yields and four in decreased yields. Increases in yield were secured in all of the spray tests beginning with 1919. These increases amounted to 10.9-94.9 bushels per acre. On the other hand, in four of the eleven tests conducted prior to 1919 the yield of the sprayed plots was less than that of those unsprayed and in three others the increases noted were small. These differences can probably be accounted for on the grounds that in some of the earlier tests a spray machine was used that developed only 50-60 lbs. pressure, while in those conducted since 1919 the machine employed for the work developed from 175 to 200 pounds pressure and was equipped to spray four rows at a time with three nozzles to the row. Furthermore the nozzle arrangement on the latter machine was such as to cover both the upper and lower leaf surfaces with a protective film of the spray. Success in spraying is largely a question of methods; if the plants are not thoroughly cov-

ered, increased yields are not likely to follow.

The average increase from spraying with Bordeaux mixture in the years 1913 to 1918 inclusive, was 10.1 bushels as compared with 42.6 bushels for the years 1919 to 1922 and the average increase for all tests was 28.2 bushels per acre.

In this connection it must be noted that the increases noted were obtained from the control of early blight, tip burn, and in one test, from the control of hopper burn. Had late blight been present in the fields in which the spray tests were conducted, the average increases would doubtless have been considerably larger. The fact, however, that even in the absence of late blight there was an average increase of 28.2 bushels for the 10 year period and an increase of 42.6 bushels in the tests conducted since 1919 indicates the advisability of spraying the Irish Cobbler variety.

Tests with Late-Crop Irish Cobblers

In the past eight years, sixteen spraying tests have been conducted with this crop and positive results were secured in all but one. The average increase from spraying with Bordeaux mixture was 33.2 bushels per acre, the lowest increase noted was 7.0 bushels and the highest, obtained in 1922, 66.8 bushels per acre. Apart from the increased yield that can be expected there are other considerations which must not be overlooked. A film of Bordeaux protects the plant from insect attack and since it has been shown that some of the most serious diseases of the potato are disseminated by insects this factor is not to be overlooked, especially in view of the fact that the late crop is grown for seed purposes. Results of our studies indicate likewise that seed potatoes from sprayed vines will prove to be more vigorous than will tubers from similar unsprayed vines. In an experiment on this point, conducted in 1921, plants from tubers grown on unsprayed vines in 1920 showed on June 25 an average height of 11.5 inches with 45 per cent of the leaves yellow. On the other hand, the average height of vines on the plots

planted with tubers produced on sprayed vines in 1920, was 13.2 inches with only 22 per cent of the leaves yellow. The average yield of the plots planted with tubers from the unsprayed plants was 34.8 bushels per acre as compared with 48.7 bushels for the tubers from the sprayed plants.

Spray Tests with the American Giant Variety

In all of the tests with this variety conducted prior to 1922, the only foliage diseases present were light infections of early blight and tip burn, which probably accounts for the fact that greater increases were not obtained following spraying. In a test conducted in 1922, however, late blight was present and was quite severe. In this test seven applications of Bordeaux mixture gave an increase of 69.4 bushels as compared with the yield of adjoining unsprayed check plots. It is apparent from these results that when this disease is present in the field, spraying the American Giant would give satisfactory returns.

Home-made vs. Commercial Bordeaux Mixture

In some of the spraying tests various commercial Bordeaux mixtures were included to compare their relative efficiency with that of home-made Bordeaux.

The relative efficiency of home-made

and commercial Bordeaux mixtures is clearly apparent as the result of a spray test with the American Giant variety, conducted in 1922. In this test late blight was present and was quite severe.

Counts made on August 2 showed that 5 per cent of the leaves were dead on the plots sprayed with home-made Bordeaux mixture, while on adjoining plots, sprayed with a commercial mixture, applied at a rate to give equivalent amounts of copper per acre to that contained in the home-made mixture, 24 per cent of the leaves were dead. The average yield of the plots sprayed with the home-made was 42.9 bushels greater than that of the plots sprayed with commercial Bordeaux.

The results of the tests with these two materials indicate that the use of the home-made Bordeaux can be expected to give more efficient control of disease and consequently larger increases in yield than will the use of the commercial materials. An additional advantage of the former material lies in the fact that it is cheaper than the latter. Where difficulty is experienced in securing lime, however, or where small areas are to be sprayed, the use of a high grade commercial Bordeaux is sometimes advisable. Under some conditions, if sufficient of the commercial mixture is used, good results will follow.

SB 211
P8H6

HINTS TO POTATO GROWERS

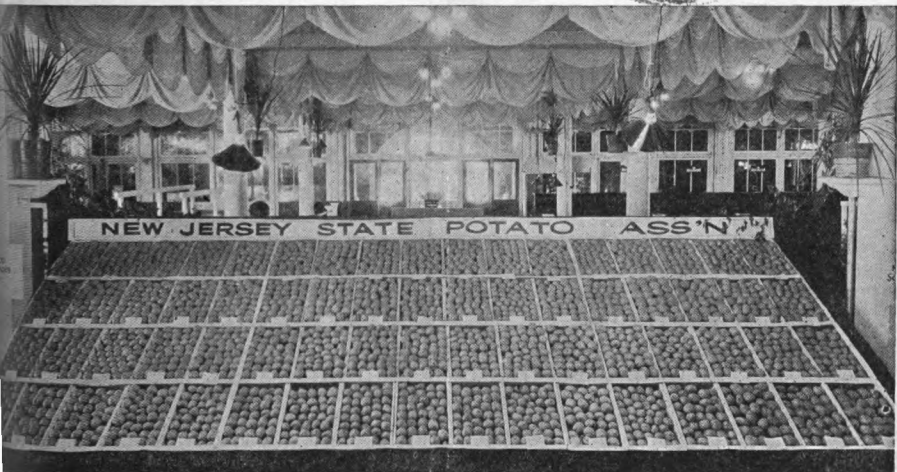
New Jersey State Potato Association

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NEW BRUNSWICK, N. J.

MAY 20 1925
January, 1925

New Jersey Certified Seed at Atlantic City



PLANTED LATE—HARVESTED IMMATURE—A HIGH QUALITY PRODUCT.

Excellent Quality at Potato Show

Cumberland County Wins Late Crop—Salem, Commercial Crop Cup

"I never knew that New Jersey could produce such high quality potatoes." This statement was made by potato experts from New York, Pennsylvania, Vermont, Wisconsin and Michigan. Some of the local growers who have questioned the value of the State Potato Show will no doubt realize from this statement that it is very much worth while. The efforts the past several years on the part of all concerned to better the quality of the New Jersey product is without question bearing fruit. There is little doubt that if New Jersey continues to grow the high quality stock of last year our potatoes will be able to compete suc-

cessfully on any market with potatoes grown in other sections. The excellence of the Trenton exhibit shows that it can be done. It is to the interest of all, that we see that it is done. The key-note of the annual meeting was larger yields and better quality. When we have accomplished this we need no longer speculate on the future of the potato industry. It will be placed on a sound economic basis.

Competition in the show was keen. It was only after considerable deliberation that J. B. R. Dickey, who judged the show, awarded the cup for the best exhibit of the commercial crop to Salem

County. This cup was donated by John C. Crissey, former county agent of Salem County. It is interesting to note that the cup was won by his own county. In this connection it should be stated that R. O. Vaughan, the new county agent, has been in the county for only six months. In view of this fact he is to be congratulated on the excellent exhibit which he had at Trenton. The late crop cup was won by Cumberland County. County agent Cortelyou and his committee had the best exhibit of late crop cobbles ever shown at a state show. This is Mr. Cortelyou's first year as county agent and his county can well afford to be proud of him. Since Cumberland County has won the cup three times it becomes the permanent possession of the county.

This year the other counties had excellent exhibits at the show. Monmouth County, for example, won 5 of the 10 medals awarded in the commercial crop division. The number of exhibits from the various counties for the past five years is shown in the following table:

	1921	1922	1923	1924	1925
Burlington	16	18	8	0	0
Camden	18	13	37	0	0
Cape May	0	0	1	43	41
Cumberland	31	45	88	71	113
Gloucester	0	0	11	48	0
Mercer	109	85	60	36	24
Middlesex	33	16	0	20	25
Monmouth	27	61	102	57	32
Salem	68	135	129	129	101
Somerset	1	1	2	2	0

One of the surprises of the show was the excellent exhibit from Cape May County. This was due largely to the efforts of R. E. Reeves and S. E. Stone, teachers of agriculture in the Cape May high schools. As a result of their activities last year and also due to the interest shown by S. L. Faust of the Shiloh schools, a special class was made this year for vocational schools. Two cups were awarded, one for the best exhibit

of commercial, and the other for the best exhibit of late crop potatoes. Both of these cups were won by the Shiloh school. The commercial crop cup was donated by Wm. B. Duryee, president of the Potato Association, and the late crop cup, by Mrs. Robert Irving, of Haddonfield. In addition to the cups, gold and silver medals were awarded the best exhibits in each division shown by the boys. The medals in the commercial crop class were won by James Munyon and Percy Davis, and in the late crop, by Lewis Schibley and Samuel Sproul.

A complete list of the medal winners awarded for the best exhibits in each class in the show follow. In addition, the names of the ribbon winners in the various counties are given.

Commercial Crop

STATE AWARDS

Cobblers

Gold Medal—John Gordon, Salem.
Silver Medal—B. C. Cook, Farmingdale.

Green Mountains

Gold Medal—George Waln, Freehold.
Silver Medal—B. C. Cook, Farmingdale.

Giants.

Gold Medal—James McKnight, Freehold.
Silver Medal—Wm. Clayton, Freehold.

Red Skin

Gold Medal—Samuel Ridgway, Salem.
Silver Medal—L. Hoffman, Cold Spring.

Miscellaneous

Gold Medal—G. C. Snook, Trenton.
R. F. D. No. 3.
Silver Medal—Frank Swain, Cape May Court House.

(Cont. on Page 4)

Hints to Potato Growers

Published monthly by State Potato Association

WM. H. MARTIN,
N. J. Agr. Exp. Station,
New Brunswick, N. J.
Corresponding Secretary

Membership dues.....\$1.00 per year

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Lewis, Charles Oakley, Wm. B. Dur-
yee, Harvey Dey, A. W. Gertzel, Wil-
lard Gardner, Floyd Harris.

Plans For 1925

The men who have been in office for the past two years were re-elected for 1925.

The Executive Committee was not changed but within the next several weeks a number of changes are to be made. The new Executive Committee is to be made up of a representative of each of the important potato-growing sections, these men to be appointed by the county boards of agricultures in their respective counties. In addition, a member is to be appointed from each of the farmers' exchanges in the State. As soon as this committee has been organized, a meeting is to be called at some convenient point in order to discuss the plans of the Association for the coming year.

The Banquet

About 100 potato growers and their wives attended the annual banquet. This was the fifth annual affair and those who attended agreed that it was the best. Colonel H. N. Schwarzkopf, Superintendent of the New Jersey State Police, gave an interesting summary of the activities of his organization during the past year. This alone was worth while, since most of those who heard him had no conception of the many and varied duties of this very important organization. At the conclusion of his remarks those present went on record as approving the request for an increased appropriation for the State Police and urging that this organization receive any support necessary to maintain it at highest efficiency.

Prof. Livingston Barbour, of Rutgers University, then gave some of his justly celebrated readings. This proved to be a most enjoyable feature of the program and the potato growers will want to hear Professor Barbour again.

Last year the membership in the Association was so very small, at one dollar a year the membership dues were insufficient for printing "Hints to Potato Growers." The deficiency was paid for out of the certification fees. This is an unfortunate situation. There is no reason why we cannot have 1,000 paid members in our Association. There were, for example, over 300 exhibitors at the Potato Show. Every one of these men should belong to the Potato Association. At this time there is probably no better way to invest a dollar. The work done by the Potato Improvement Committee, in which the Potato Association has co-operated, has been worth untold dollars to the potato growers of the state. This is only one line of activity in which we might engage. With a larger membership we can accomplish much more. The New Jersey potato is on the rapid road to complete recovery. Every potato grower should help facilitate this.

COUNTY AWARDS

MERCER COUNTY

Cobblers

1. G. C. Snook..Trenton, R. F. D., No. 3
2. H. E. Hulshart.....Allentown
3. Earl Dilatush.....Robbinsville
4. Thomas H. Rogers.....Allentown

Green Mountains

1. Thomas H. Rogers.....Allentown
2. G. C. Snook..Trenton, R. F. D., No. 3
3. H. E. Hulshart.....Allentown
4. F. W. Konover.....Dutch Neck

Miscellaneous

1. H. E. Hulshart.....Allentown
2. A. E. Snook..Trenton, R. F. D., No. 3
3. Wilber B. Dey.....Hightstown
4. Elwood CroshawHightstown

MIDDLESEX COUNTY

Cobblers

1. John FortshJamesburg
2. Spencer PerrineCranbury
3. Geo. Davison & Son.....Cranbury
4. R. P. Mershon.....Cranbury

Green Mountains

1. John FortshJamesburg
2. A. E. Perrine.....Cranbury
3. A. C. Grover.....Cranbury
4. Walter FarrPlainsboro

Miscellaneous

1. H. H. Dey..Hightstown (Russetts)
2. Geo. Davison & Son
.....Cranbury (Russetts)

MONMOUTH COUNTY

Cobblers

1. E. F. Miller.....Freehold
2. Wm. Applegate.....Freehold
3. James McKnight.....Clarksburg
4. Geo. Walin.....Allentown

Green Mountains

1. Miller & Van Derveer.....Freehold
2. C. Willett.....Phalanx
3. Wm. H. Gravatt.....Clarksburg
4. E. F. Miller.....Freehold

Giants

1. Thomas FoxFreehold
2. Edgar ReidTennent
3. F. S. Blain.....Freehold

SALEM COUNTY

Cobblers

1. Robert NewellSalem
2. W. FrearSalem
3. James PettitSalem
4. S. B. Davis.....Salem

Red Skins and Superba

1. Earl Moore.....Elmer (Red Skin)
2. Herbert Hitchner
.....Daretown (Superba)
3. Earl Moore.....Elmer (Superba)
4. Herbert Hitchner
.....Daretown (Red Skin)

CUMBERLAND COUNTY

Cobblers

1. Frank L. Ott.....Bridgeton
2. Albert NewkirkBridgeton
3. Hannon & Hannon.....Bridgeton
4. Johnson BrothersElmer

Green Mountains

1. Percy FoggBridgeton
2. Frank L. Ott.....Bridgeton

Red Skin

1. 'R. Hamil DavisBridgeton
2. W. W. OleyBridgeton

CAPE MAY COUNTY

Cobblers

1. Elmer Cox.....Ocean View
2. S. Hand & Son
.....Cape May Court House, R. F. D.
3. Russell Taylor..Cape May, R. F. D.

Red Skins and Superba

1. S. Compton & Son
..Cape May Court House, R. F. D.
2. Harry Nichols..Cape May, R. F. D.
3. A. M. Hudson.....Woodbine
4. J. LaytonWoodbine

Miscellaneous

1. Ralph Taylor....Cape May, R. F. D.
2. M. Abbott
..Cape May Court House, R. F. D.
3. J. May & Son.....Woodbine
4. I. Abrams & Son.....Woodbine

Late Crop

STATE AWARDS

Cobblers

- Gold Medal--J. Norton Woodruff,
Bridgeton.
Silver Medal--F. L. Foust, Bridgeton.

Green Mountains

- Gold Medal--Earl Dilatush, Robinsville.
Silver Medal--Frank L. Ott, Bridgeton.

Miscellaneous

- Gold Medal--Moore Bros., Bridgeton.
Silver Medal--C. E. Moore, Daretown.

Giants

- Gold Medal--Frank L. Ott, Bridgeton.

COUNTY AWARDS

CUMBERLAND COUNTY

Cobblers

1. John T. Harrin.....Shiloh
2. Chas. CudreyShiloh
3. John CulesBridgeton
4. Frank L. Ott.....Bridgeton

Green Mountains

1. Percy Fogg.....Bridgeton
2. Frank L. Ott.....Bridgeton

Miscellaneous

1. W. W. OleyBridgeton

SALEM COUNTY

Cobblers

1. Earl MooreElmer
2. Frank DavisWoodstown
3. C. E. Moore.....Daretown
4. J. C. Crissey.....Salem

Green Mountains

1. S. L. MooreElmer
2. Earl MooreElmer

Miscellaneous

1. Edward Shim.....Hancock's Bridge
2. H. B. Young.....Hancock's Bridge

MERCER COUNTY

Cobblers

1. John HankinsonGlen Moore

Green Mountains

1. Earl DilatushRobbinsville

Vocational Schools

CAPE MAY COUNTY

LATE CROP

Cobblers

1. Henry Schellenger.....Green Creek

COMMERCIAL CROP

Cobblers

1. Edwin NoonEldora
2. Clinton Elliott.....Cape May, R. D.

Red Skins and Superba

1. Cowan BrosCape May, R. D.
2. Clinton ElliottCape May, R. D.
3. Nicholas Bros.Cape May, R. D.
4. Fulton EwingCape May, R. D.

Miscellaneous

1. Sidney LeninWoodbine
2. John ChambersEldora
3. Edwin NoonEldora
4. Edgar McPhersonCape May

MONMOUTH COUNTY

COMMERCIAL CROP

Cobblers

1. Elbert Baslay.Farmingdale (Russetts)

Russetts

1. Elbert BaslayFarmingdale

CUMBERLAND COUNTY

COMMERCIAL CROP

Cobblers

Gold Medal—James Munyon, Bridgeton.
Silver Medal—Percy Davis, Bridgeton.

1. Jos. HuntsingerBridgeton
2. Edward W. HarrisBridgeton
3. Henry LawrenceBridgeton

Red Skins

1. Belford AyarsBridgeton

LATE CROP

Cobblers

Gold Medal—Lewis Schibley, Bridgeton.
Silver Medal—Samuel Sproul, Bridge-
ton.

1. John M. Cardrey.....Bridgeton
2. Lester RineerBridgeton
3. Belford AyarsBridgeton
4. Frank HarrisBridgeton

SALEM COUNTY

COMMERCIAL CROP

Cobblers

1. Frank HarveySalem
2. Ed. AmbrustonSalem

LATE CROP

Cobblers

1. David GrierSalem

**The Potato Appellate
Court**

The appeal of the prosecution in the trial of the "Potato" was heard on potato day at Trenton before Judges Agee and Brunner.

The prosecution represented by Frank A. MacNamee, of Plainsboro, stated emphatically that the prosecution had presented sufficient evidence to convict the defendant of the crimes with which he was charged, and charged that because of misplaced sympathy not a single jury has been willing to convict. He stated also that bringing the defendant to trial had met with popular approval, but that a conviction could not be obtained, although the defendant was put in a very bad position.

Summing up the evidence presented at the lower court trials, the prosecutor said that growers of potatoes tried to get away with practices in the crop that would send them on the rocks if applied to fruit. The county agents, expert witnesses, agree that practices known to be helpful to quality are used by a very small percentage of the growers. The bankers, according to the prosecutor, have testified that "New Jersey Potato" has caused them to restrict credit, due to the serious financial situation following the growing of this crop. The dealers have shown that there is inability to unite upon a standard grade, although all admit its desirability.

Prosecutor MacNamee referred to the fact that it was impossible now to get as much per sack for "Potato" as for similar quality from some other sections. Large farming areas have turned, under the urge of diversification, to potato production, and they are filling their nearby markets which we formerly supplied. The prosecutor stated that defense coun-

sel had talked a lot about improvements which he thinks are coming, but these have not been evident yet. Mr. MacNamee spoke about the depreciation of land value caused by "Potato," the loss of farms by progressive growers, the defendant's failure to pay for services rendered, and the mental anguish and shock he has brought to the entire potato community. He then made an appeal for a favorable verdict, so that "Potato" might be convicted before an impartial court of the losses he had caused.

In making his defense, Mr. H. J. Butcher, of Cranbury, took exception to most of the prosecutor's statements. He referred to the high caliber of the juries who had heard the case and rendered the verdict "not guilty." Further, said Mr. Butcher, the audiences, totaling 1,000 people, had been polled individually, and 99 per cent of them had endorsed the jury's verdict. The defense counsel did not attempt to deny the bad reputation suffered by the defendant, but stated that this was due to those who grew and handled the crop, and was not the defendant's fault. He spoke of means that should be employed to improve the defendant's reputation, including the use of adapted soil, certified seed, spraying the crop and careful methods of culture. The defense counsel said that the crop must be graded to a uniform standard, and that the dealers and growers had outlined a plan whereby this might be accomplished.

Mr. Butcher made a stirring plea for a favorable verdict on the ground that already many improvements were being developed. He believed the defendant should be given another chance under more favorable conditions and the application of business principles to the production and marketing of the crop.

The case was reviewed by Secretary Agee, who, after referring to the arguments of both sides, announced the higher court's decision to affirm the verdict of the lower courts, namely "not guilty" but added "better not do it again."

A large audience in Rider Auditorium listened with a great deal of interest to the arguments, and the decision was a popular one.

Rainfall and Scab

There was probably less scab in New Jersey in 1924 than at any time in the past ten years. In many instances clean potatoes were grown in fields where in previous years the crop had been severely scabbed. This fact has, in many instances, bred a false security. Many growers believe that they need anticipate no further difficulty with this disease. There is no reason for this belief. The organism causing scab is still present in the soil; the fact that the potato crop was not severely scabbed last year may be accounted for on the grounds that conditions were not favorable for the development of the scab organism. It is a known fact that scab is more likely to be severe on an alkaline than on an acid soil. There is abundant evidence also to show that the disease is less likely to be severe in a wet than in a dry soil. It follows then that in a wet season scab will not be as severe as in a dry one. This has been the case the past two years. In 1923, a dry year, scab was severe; in 1924, one of the wettest we have had for some time, the injury to the crop from scab was slight.

During the past several years we have conducted a series of tests in the greenhouse to determine the influence of soil moisture on scab. Potatoes were grown in pots containing soil adjusted to various moisture contents, ranging from 30 to 60 per cent. In those pots where the soil contained 30 per cent moisture, 84.7 per cent of the surface of the tubers was scabbed. In the pots containing the wet soil only 38.5 per cent of the surface of the tubers was scabbed. The soil in these pots was alkaline. In another lot of pots, in which the soils contained the same quantity of water but were made acid by the addition of sulfur, 41 per cent of the surface of the

tubers was scabbed in the dry, and 2.6 per cent in the wet. These results show clearly the influence of soil moisture and acidity on scab.

In addition to these studies in the greenhouse, a series of tests was conducted in the field on the J. H. Kandle farm at Elmer. In these tests scab counts were made on approximately 40 bushels of potatoes each year since 1920. In the 5-year period the rainfall during the summer months varied from 10.56 to 21.37 inches and the amount of scab from 20.7 to 83.4 per cent. The year 1921 was the driest and in this year scab was most severe. In 1924 there was 21.02

inches of rainfall and only 16.6 per cent of the crop was scabbed. With the advent of dry weather this year we are convinced that scab will again be severe on these plots.

These results are worthy of your serious consideration. No one can afford to take chances with planting potatoes this year on land which has previously grown a scabby crop. The fact that there was no scab last year is no indication that it will be absent in 1925. If potatoes must be planted on land which has grown a scabby crop, it is highly advisable that preventive measures for scab be adopted.

South Jersey Certified Seed

Following is a list of growers of certified seed who still have seed potatoes to sell. The supply is not great and there promises to be a brisk demand for South Jersey seed this spring. In every case but one the variety indicated is the Irish Cobbler:

<i>Name</i>	<i>Address</i>	<i>Bus.</i>	<i>Strain</i>
Robert G. Baynes	Woodstown	560	Maine certified
B. Franklin Bishop	Elmer	625	Smith—Maine
M. H. Coombs	Salem	400	Kandle's
Robert P. Ewing	Greenwich	250	Own
Edwin J. Grosscup	Hancocks Bridge	3,250	Kandle's
Miller Gibe	Elmer	250	Own
Lester S. Harris	Hancocks Bridge	1,000	Kandle's
John Hankinson	Glen Moore	650	Brigham—Vt.
		150	P. E. I.
E. E. Hires	Elmer	375	Kandle's
Jacob L. Hepner, Jr.	Deerfield St.	1,000	Own
Jones	Bridgeton	60	P. D. Fogg
Minch Bros.	Bridgeton	1,500	Own
Robert Newell	Salem	500	P. D. Fogg
		250	Maine certified
John R. Newkirk	Bridgeton	625	Own
Linwood H. Patrick	Salem	360	Own
John A. Patrick	Salem	310	Kandle's
Smith Bros.	Monroeville	1,250	Maine certified
A. Schnetzler	Elmer	4,000	Kandle's
Edmund Shimp	Hancocks Bridge	8,500	Shimp's (Kandle)
M. C. Tice	Deerfield St.	500	Own
H. C. Whitehead	Salem	1,000	Kandle's
Henry P. Young	Hancocks Bridge	310	Kandle's
P. D. Fogg	Bridgeton	575	Green Mts.

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P8 H6

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 5, No. 10

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February, 1925

Play Safe With Potatoes in 1925

CHAS. B. PROBASCO

In offering some suggestions for the 1925 potato crop, which I feel will be of benefit to our farmers, I want it understood that these suggestions are given with the best of intentions and with the thought that their adoption will lead to bettered conditions in the potato industry.

In central New Jersey we have a wide variation in types of soil, ranging from very light sandy loam to stiff clay and red shale. Potatoes, and particularly the Cobbler variety, are rather critical as to the type of soil on which they are grown. If the soil on one farm is capable of producing a 300 bushel crop, while the soil on another is capable of producing only a 150 bushel crop, what chance has the man who plants potatoes on the 150 bushel farm? We all know that the success of the Ford Motor Company, in a great measure, is due to low production costs. The potato growers' costs have been too high. There are two things of vital importance to be considered to reduce these costs. First, take an inventory of your land, consider whether it is suitable not only for the production of a big yield but a big yield of good quality. Don't plant potatoes on scabby land. If your land will not produce potatoes, it is advisable to devote it to some crop other than potatoes.

The second point to consider in the reduction of costs is in the buying of supplies. Central New Jersey spends as much money per acre to plant potatoes as any section in the United States. It has been truthfully said that farmers

cannot buy at retail and sell at wholesale and make money. Let me add that they can't buy even at wholesale without money. We know the successful business men of the country discount their bills and fight to get additional discounts. When their working capital runs low they borrow and the amount of business a merchant does is often governed by the amount of his working capital plus his borrowing capacity.

Agriculture is the biggest business in this country and potato production the biggest farm business in central New Jersey. Surely the same horse sense business methods which have made corporations successful are safe foundation stones upon which to build a prosperous potato section. Greatness usually has a modest beginning, a beginning in which strict attention is paid to details. In reviewing the failures, assignments, bankrupts, and those who have just thrown up their hands and quit the potato game, nearly every case shows loose, careless habits, too often the habit of gambling with the other fellow's money, buying unnecessary machinery and automobiles. Almost without exception, the machines, fertilizers, and seed potatoes were bought without much attention being paid to price so long as settlement could be delayed until convenient.

In planning for the 1925 potato crop, let's begin by selecting land which is naturally adapted to potatoes; plant certified seed or seed that we have good reason to believe is good; and arrange

to pay cash for this seed and the necessary fertilizer. You say, "what about the man who has neither money or credit at the bank?" The answer is he

must decide whether he can afford to plant potatoes and start the year handicapped by the 15 or 20 per cent extra costs.

Some Lessons from the Salem County Potato Fertilizer Experiment

A. W. BLAIR

Eight years ago some of the potato growers in Salem county raised the question as to the relative value of fish and tankage as sources of nitrogen, and in order that the Experiment Station might have at its command more definite information on this and also on other questions bearing on potato fertilizers, a carefully planned experiment was started in 1917 on the farm of J. Harry Kandle a few miles south of Elmer in Salem county. The soil is a sassafras loam well adapted to the growing of potatoes and is fairly representative of much of the soil found in the better potato growing sections of the state.

With the results from the 1924 crop, the data for eight year's work on this project are now available. It is thus possible to get some idea of the effect of definite fertilizer treatments when potatoes are grown consecutively over a period of years. A report of this nature must necessarily be very brief and only some of the more important points can be touched upon.

Different nitrogenous materials were used separately and also in combination as sources of nitrogen. A so-called standard fertilizer (4-8-3) was used in amounts varying from 800 to 2800 pounds per acre. The standard application was fixed at 1600 pounds per acre, that is, 64 pounds of nitrogen (approximately 80 pounds of ammonia), 160 pounds phosphoric acid, and 60 pounds of potash.

The 7-year averages (the results for 1923 have been omitted on account of

unusually low yields) throw some light on the problem.

Higher average yields were obtained when the nitrogen was taken from at least two sources than when all was taken from one source.

Better yields were also obtained when as much as half the nitrogen was taken from a quickly available material like nitrate of soda.

There was little difference in the yields with fish and tankage whether used as the sole source of nitrogen or in combination with one or more other materials.

Potatoes grown with a material which tends to make the soil more acid—ammonium sulfate for example—were less injured by the scab fungus than those grown with materials which have less effect on the soil reaction. It would therefore seem advisable to take a part of the nitrogen from sulfate of ammonia, if the soil is known to be infected with scab fungus.

The 7-year average yield without fertilizer was 163 bushels per acre; with 800 pounds of the 4-8-3 it was 213 bushels per acre, thus giving a gain of 50 bushels for the 800 pounds of fertilizer. With an additional 400 pounds, that is 1200 pounds per acre, the yield was 243 bushels per acre or a gain of 80 bushels over the check plot. This is a splendid demonstration of what can be done in the way of increasing yields by the moderate use of fertilizers.

With applications of 1600, 2000, and 2400 pounds per acre, the average yields were 248, 256, and 276 bushels per acre

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dle, Earl Dilatush.

respectively. Whether these increases are sufficient to justify the additional expenditure for fertilizer will depend largely upon the cost of the fertilizer and the selling price of the crop. The type of soil, previous treatment, and weather conditions must likewise be taken into consideration. Twenty-eight hundred pounds gave no increase over 2400 pounds.

Sixteen hundred pounds of the fertilizer without potash, that is a 4-8-0, gave an average yield of 212 bushels; the same amount of 4-8-3 gave an average yield of 248 bushels, and the same amount of 4-8-6 gave 259 bushels per acre. The 4-8-10 gave an increase of only 3 bushels per acre over the 4-8-6.

It is thus quite evident that for the

type of soil in question, the grower is fully justified in using at least 3 per cent of potash. He will probably find it profitable to use as much as 6 per cent.

For potatoes, on soils similar to that on which this experiment is being conducted, it would appear that the minimum fertilizer requirement would be about 60 pounds of ammonia, 96 pounds of phosphoric acid, and 36 pounds of potash. This could be met by the use of 1200 pounds of a fertilizer analyzing 4 per cent nitrogen (approximately 5 per cent ammonia), 8 per cent phosphoric acid, and 3 per cent potash.

The amount may be increased up to 2000 pounds as conditions warrant, and the potash may, with profit, be increased to 6 per cent.

Some Potato Facts Relative to New Jersey

In 1890, the potato acreage of New Jersey was about 47 per cent of the 70,000 acres occupied by potatoes in New Jersey, Virginia, Long Island, Maryland, Delaware, North Carolina, South Carolina and Florida. In 1900, the potato acreage of this area increased to 96,000 acres, New Jersey's percentage of this total being about 38. In 1910, the total area increased to 163,000 acres, of which New Jersey had 37 per cent. In 1920, the area increased to 231,000 acres of which 31 per cent was found in New Jersey. Since 1920, almost the same thing has been happening. The potato acreage of the Atlantic coastal plain States has been generally increasing and New Jersey's relative position becoming weaker. From 1890 to 1920, the potato acreage of the coastal plain section increased to 228 per cent and during the same period the population of the United States east of the Mississippi River increased 60 per cent. In New Jersey, from 1866 to 1888 the acreage and production tended to remain fairly uniform over the entire period.

From 1888 to the present time, the acreage trend has been upward, with a tendency to fall off in recent years and the production trend has been upward at a greater rate than that of acreage, with no tendency to fall off in recent years, when the entire period is considered. From 1902 to 1924, the upward trend of production in New Jersey and in nine northwestern States increased at a faster rate than the one prevailing in New Jersey and the United States. Since 1911, the average price of New Jersey cobbles has been declining. Since 1918, the average price of New Jersey cobbles has been lower than the prices of potatoes from Maine, New York and Western States.—H. B. WEISS.

Seed-Potato Disinfection Successful in New Jersey

Extensive seed-disinfection demonstrations were conducted last year in Monmouth and Middlesex counties by County Agents Douglass and Bowen. In order to make arrangements for this work, a meeting was scheduled in each important potato-growing community. At this meeting the practice of disinfecting seed potatoes was discussed, and at the same time several sacks of seed were disinfected by the cold corrosive-sublimate method. This seed was planted alongside untreated seed on the farm

where the demonstration was conducted. During the growing season careful observations were made to determine the stand, and at harvesting time yield data and scab counts were obtained. In Monmouth county, the average yield of a number of tests was 81.5 barrels for the treated, and 77.3 barrels for the untreated. In addition to this yield difference, there was an increase of 13 per cent in the number of clean tubers on the treated plots. In several instances, where records were kept of the cost of the operation, the cost was found to vary from 85 cents to \$1 per acre.

O. G. Bowen, county agent, Middlesex county, reported on demonstrations conducted on 8 farms. In one instance a decrease of 7 bushels was recorded, while in the others increases amounting to as much as 40 bushels per acre were obtained, the average increase on the 8 farms being 17.6 bushels. In every instance there was an increase in the number of tubers free from scab, amounting in one case to 28.9 per cent, with an average increase of 11.7 per cent.

The results of these and similar demonstrations conducted by County Agent Douglass, in 1923, have aroused considerable interest in the possibilities of seed-potato disinfection, and the indications are that the practice will be adopted by a large number of growers this year.

Don't forget to send your membership dues to W. H. Martin, Experiment Station, New Brunswick, or to Walter Minch, Bridgeton, N. J. Let's make it 1000 members in 1925. We want to put the New Jersey potato industry on a sound basis.

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HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 6

NEW BRUNSWICK, N. J.

October, 1928

A Study of Pressure Requirements for Spraying Potatoes

WM. H. MARTIN

Spraying experiments with potatoes have been conducted by the Experiment Station since 1913. During this 16 year period wet and dry seasons have been experienced, years when blight was prevalent and still other seasons when leafhoppers were present in large numbers. The yield increases were greater in some years than in others but the average increase for the 16 year period is approximately 40 bushels per acre. There is no longer any question as to the value of spraying, these tests have demonstrated this point beyond any question of doubt. The results secured by the many growers who have adopted spraying the past five years have likewise clinched the argument in favor of spraying potatoes with Bordeaux Mixture.

There still remain several points concerning the method of spraying which have not been entirely settled. Very frequently we have requests concerning the pressure necessary to employ for best results. In some quarters it is stated that 350 pounds pressure is necessary while it is a known fact that good results have followed where much lower pressures have been employed. The question of the amount of pressure necessary for best results is, to a certain extent, tied up with the pest being combated. In the case of Aphids there is little question but that a high pressure, certainly not less than 250 pounds per square inch, is necessary if this insect is to be controlled. On the other hand, where other troubles of the potato are

being combated a lower pressure is believed to be satisfactory.

It was with this thought in mind that a spray test was started on the Alfred Sloan farm at Shirley this year. In this test a comparison was made of 5-5-50 Bordeaux Mixture applied at 150, 250 and 350 pounds pressure. An engine driven sprayer was used and with the exception of one spray application no difficulty was experienced in holding the desired pressures. In this case, the third spray application, the spray was applied at 325 rather than 350 pounds pressure.

The first spray application was made when the vines were 8 inches high. Each of the various spray treatments was repeated 8 times in 4 row plots. At the time of harvest yields were obtained from the two center rows of each plot. The test was conducted with the Irish Cobbler variety and five spray applications were made on the following dates, June 9, June 19, June 27, July 7, and July 18. The check plots were sprayed with calcium arsenate at the first four applications while the other plots were sprayed with home-made 5-5-50 Bordeaux Mixture plus calcium arsenate. The sprays were applied at the rate of approximately 100 gallons per acre.

Flea beetles were observed to some extent in this field by June 19th but did not become abundant until later in the season. By July 18th the damage they had done was plainly apparent and a number of leaves were collected on this date to determine the average number of punctures per leaf. The results of these counts are shown in Table I.

TABLE 1.

Treatment	Flea Beetle Punctures Per Leaf
Check (Calcium Arsenate)....	205.2
5-5-50 Bordeaux 150 lbs.....	87.4
5-5-50 Bordeaux 250 lbs.....	73.6
5-5-50 Bordeaux 350 lbs.....	99.7

On the plots sprayed with an arsenical alone the leaves were riddled with flea beetle punctures. This fact would be more than ample to explain in considerable part the reduction in yield on these plots as compared with those sprayed with Bordeaux Mixture. On the latter the number of punctures per leaf was approximately the same regardless of the pressure used, being less than half the number on the sprayed leaves. This difference was greater than the figures would indicate since the leaves from check plots were somewhat smaller than those from the Bordeaux sprayed plots. It should be said here that an attempt was made to select the leaves from the same general location on the plants in the different plots.

Leafhoppers were first observed in this field on June 27. On that date the number was small but by July 7 they were present in large numbers. On July 18 leafhopper injury was very prevalent and counts were made at this time to determine the number of dead leaves on the various plots as the result of the activities of this insect. The results of these counts are presented in Table 2.

TABLE 2.

Influence of Spray Treatments on
Leafhopper Injury

Treatment	Per Cent. Dead Leaves
Check (Calcium Arsenate)....	76.1
5-5-50 Bordeaux 150 lbs.....	8.3
5-5-50 Bordeaux 250 lbs.....	7.6
5-5-50 Bordeaux 350 lbs.....	11.4

On the plots receiving calcium arsenate alone 76.1 per cent. of the leaves were dead as compared with an average

of 9.1 on the plots sprayed with Bordeaux Mixture. It is clear that proper spraying with this fungicide without the addition of any other insecticide will give control of the leafhopper. Some growers have raised a question concerning the advisability of adding nicotine sulfate to Bordeaux Mixture. This is not only unnecessary but is a waste of money since the Bordeaux alone will give good control.

Based on the number of dead leaves there is but little to be said in favor of any one of the three pressures employed. The higher pressures gave slightly better control than 150 pounds but the differences are not marked and it is very questionable if they are sufficiently large to conclude that one pressure is superior to the other.

The various plots included in the experiment were harvested on Aug. 28. The yields are shown in Table 3.

TABLE 3.

Influence of Spray Treatment on Yield

Treatment	Yield Per Acre, Bushels		
	Primes	Seconds	Total
Check (Calcium Arsenate)	260.8	33.1	294.0
5-5-50 Bordeaux 150 lbs.....	322.0	37.9	360.0
5-5-50 Bordeaux 250 lbs.....	326.7	35.4	362.2
5-5-50 Bordeaux 350 lbs.....	331.3	35.0	365.3

The average total yield of the check plots was 294.0 bushels per acre while the average of all plots sprayed with Bordeaux Mixture was 362.5 bushels, an increase of 68.5 bushels per acre in favor of the five applications of Bordeaux. Even in this year of low prices the increase from spraying more than paid for itself. At 50 cents a bushel the increased returns from spraying amounted to \$34.25 an acre.

It will be noted from the table that the yield increased slightly as the pressure was increased, the difference between the 150 and 350 pound applica-

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tions being only 5.3 bushels per acre. It is clear that regardless of whether the Bordeaux Mixture was applied at 150, 250 or 350 pounds pressure the yield increases were approximately the same. In spraying for the control of leafhoppers it is essential that the leaves be well covered with a film of the spray material.

After all, success in spraying is not measured so much by the pressure employed as it is by the covering obtained on the leaves. If the leaves are protected by a coating of Bordeaux Mixture, good results will follow, this despite the pressure employed. In all spraying operations the grower must see to it that the spray boom and nozzles are adjusted so as to properly cover the leaves. In some cases the top nozzle is found to be too low and the grower attempts to rectify this by raising the entire boom. This merely results in the fact that the bottom leaves of the plant are not sprayed. Rather than raise the entire boom

the top nozzle alone should be raised. The nozzle arrangement needs to be modified at each spray application to keep pace with the growth of the plant. If this is carefully done, no difficulty will be experienced in obtaining a satisfactory covering of the leaves.

For the control of leafhoppers and late and early blight of the potato, we recommend that a pressure of approximately 150-200 pounds be employed. It is doubtful if a pressure under 150 pounds will give results. From the results presented here there is little to support the claim that 350 pounds pressure is necessary for the control of leafhoppers or flea beetles. It must be remembered that the results presented here are for one year only and it is difficult to base conclusions on the results of one year's work. Observation of previous years, however, would indicate that the information secured from this test is in line with what would be expected to follow under New Jersey conditions.

Improving the Potato Industry

During the past month several important meetings have been held in various parts of the country to discuss means of improving conditions in the potato industry. On the Eastern Shore the potato growers' difficulties are attributed, by the Bureau of Agricultural Economics and the Maryland and Virginia Experiment Stations, to (1) the acreage and production increase, (2) the lack of development of the spirit of cooperation, (3) the lack of accurate knowledge of cooperation and its problems, (4) the pursuit of old habits of marketing which hinder cooperation. To remedy this situation the interviewed farmers of the section, suggested: (1) curtailment of acreage, (2) the elimination of barter transactions in fertilizer and seed stock, (3) greater interest in the work of their cooperative and other agencies, and (4) the dissemination of accurate marketing and other economic information among members of the association.

On November 20 a meeting was called in Chicago by a number of shippers and dealers to discuss ways and means of improving the industry. Among other tentative suggestions they recommended: (1) the adoption of state laws requiring compulsory grading and inspections, (2) that growers and shippers confine their shipments of potatoes to those grading U. S. No. 1 as determined by federal or state inspections, (3) that federal shipping point inspection be made, and, (4) that potato growers, shippers and dealers be organized into a national association. In general, the plan is based, for most part, on teaching the grower how to produce better potatoes and to educate the buyer of potatoes.

A second meeting was called for December 4, 5 at Chicago to discuss the following points: (1) national standardization of grades, (2) uniform marketing practices, (3) elimination of national crop surpluses, (4) food value of cull potatoes for live stock, and, (5) need for a national organization to guide the destiny of the potato industry.

Several of the statements sent out are extremely interesting, and are in agree-

ment with the potato improvement program which has been under way in New Jersey for some years. It is agreed that nothing can be done to change climate and "it does not seem possible at the present time to limit acreage except through the natural law of mortality. The action of this principle is slow, inefficient, cruel and harmful to society. It would, therefore, seem that if the potato industry is to be stabilized, it must be done after the crop is produced."

It is suggested that there should be a law to establish four grades. In years of heavy production, only high grades could be shipped. In years of great shortage, all grades could be shipped. In between the extremes, all but the lowest grades could be shipped. The benefits of these are said to be: stabilization of prices and acreage. The latter through removing the speculative element, would result in elimination of marginal land. In addition "more efficient farming would result because profit can only be made by using good seed planted on good land and properly cared for." This last statement sounds like many of the sermons that have been preached to New Jersey potato growers during the past 5 years.

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 7

NEW BRUNSWICK, N. J.

November, 1928

Improving the New Jersey Potato Industry

WM. H. MARTIN

At a recent meeting of potato shippers held in Chicago, the following recommendations were unanimously adopted.

1—That the handlers of potatoes in all shipping districts make a study of the situation in their territory with a view of affecting an improvement in the grading of potatoes.

2—That growers and shippers confine their shipments of potatoes to those grading U. S. No. 1 as determined by Federal inspections, and that all potatoes should be free from dirt or other elements that detract from appearance and affect market conditions.

3—That so far as possible Federal inspection of potatoes be secured at shipping point or in the shipping district.

4—We recommend the adoption of State laws requiring compulsory grading and inspection. Further that where such laws are now in effect or may hereafter be passed, that the officers in charge see that such laws are properly administered and enforced in accordance with the terms thereof.

The New Jersey potato growers should give serious consideration to these recommendations, for while the potato industry in this state is in much better condition than in most other potato growing sections there is still room for improvement.

The past year New Jersey stood third among all the states in average yields. The average for nearby and competing states is shown in Table I.

Maine	200 bu. per acre
New Jersey	162 bu. per acre
Virginia	143 bu. per acre

Penna.	130 bu. per acre
Florida	125 bu. per acre
New York	115 bu. per acre
Maryland	115 bu. per acre
South Carolina	113 bu. per acre
North Carolina	111 bu. per acre

It is clear that, on the basis of yield per acre, New Jersey occupies a very favorable position as compared with competing states. On a price basis also, New Jersey's crop sold as well or better than potatoes from other sections. As the result, the New Jersey growers have weathered this year of low prices in fair shape. Such has not always been the case, as will be well recalled by all growers who were in the potato game 10 years ago. At that time the New Jersey potato industry was in anything but a healthy condition. The improvement in the industry has unquestionably come about through the adoption of better production methods, among which might be mentioned change in variety, use of certified seed, seed treatment, elimination of marginal land, spraying, better grading, etc. That these changes have resulted in larger yields is apparent from a consideration of New Jersey's position among the different states. In the 20 years from 1900-1919, there were only 2 years when New Jersey stood above tenth in average yield among all the states. In the 9 years from 1920 to 1928 there were 6 years when New Jersey stood better than 10th. In 1926 New Jersey was 9th; in 1927, 4th, and in 1928, 3rd. There is no reason why New Jersey should not increase her average yield from the present 162 to 200 bushels per

acre. This should be the aim of the potato growers and of the State Potato Association.

In order to accomplish this it is necessary, first, that all so-called marginal land be planted in some crop other than the potato. This has been accomplished, to a large extent, but there are still acres planted with potatoes which cannot be expected to produce profitable returns. Light soils, poorly drained heavy soils and fields which produce scabby potatoes must be eliminated. To invest \$150 an acre in land not adapted to the crop is like betting on the last horse after the race is over. You have the experience but certainly there will be no returns on the investment. The next thing to be done is to adopt those practices which have proven to be of value in producing a maximum crop. These have been mentioned before and only passing mention need be made here. Good seed is the first requirement, high class, not high priced fertilizer, reduction of horse and man labor costs, changes in cultural practices, such as increased use of the weeder; closer planting with a consequent increase in amount of seed used per acre; protection against insects and diseases; better grading and an honest intention to put up a good pack.

All of this simmers down to the fact that, after all, the improvement of the potato industry in New Jersey depends to a large extent on the efforts of the individual. Very often the various agricultural agencies are accused of increasing yields without providing information on ways and means of disposing of the surplus at a profit. Any one giving this matter any thought will realize the fallacy of this statement. The trouble has been that in many cases when more efficient production methods are devised some growers increase their acreage. On the other hand, the wise grower realizes that the thing to do is to produce more potatoes on fewer acres—in other words, to cut production costs. See how this worked

out on 30 farms in Monmouth County in 1926. According to a survey made by A. G. Waller, on these 30 farms, representing 965 acres, the average yield was 250 bushels per acre. The cost of production varied from 51c to \$1.25 per bushel. It is evident that even in years of fairly high returns the grower who produces potatoes for \$1.25 a bushel will have trouble to make ends meet. What can he hope to do in a year such as the present? The question for each grower to ask is whether anything can be done to help the growers having exceptionally high production costs. Cutting the acreage in half will not do it, this step would merely result in the grower losing less money, while it would penalize the man who has made a success of growing the crop. Any other measure which might be adopted would likewise fail in cases of this kind. The only thing left for the grower with high production costs is to adopt the practices which have enabled his neighbor to grow the crop at half his own production costs.

As growers, we appreciate that the recommendations from the Chicago meeting, if adopted by all growers and shippers, will result in better prices. The elimination of a crop surplus through marketing only quality stock will unquestionably do this. There is likewise no question but that compulsory grading laws are a desirable thing. Had the New Jersey growers and shippers put up the pack this year that they did in 1927 it would have meant an increase in returns amounting to many thousands of dollars. Through a compulsory grade law it would no longer be possible to ship potatoes in disguise. Either they would go out of the state marked as U. S. Grade No. 1 or they would be shipped as ungraded and would be marked as such. There is no question but that this would help the industry in the state. It must be kept clearly in mind, however, that any direct benefit from the adoption of a grade law will fall on the successful

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grower and will, on the other hand, work a hardship on the man who is producing poor grade stock. Among the members of the 300 bushel club more than 90 per cent of the crop will pass the requirements of the U. S. Grade. A grower of this kind will naturally welcome the passage of a grade law. On the other hand, there are a number of cases where 50 per cent or less of the crop would not meet the grade requirements and consequently would have to be sold as ungraded stock, at a lower price. This would result in one of two things—either the grower of the low grade stock would be compelled to go out of business or he would have to change his production methods.

There is no reason why this latter step cannot be taken. This past year a number of growers lost money on potatoes; some of these same men lost money the previous year. They should analyze the situation carefully before planting another crop. If they do not

have soils adapted to the crop, the thing to do is to cut out growing it. If their soil is fitted for potatoes and they are still losing money, then we can see only one solution of the difficulty. The individual must readjust himself to the changing conditions of the industry. A few years ago some growers made the statement that if they had to spray they would stop growing potatoes. Some of these men have changed their minds and are still growing the crop—successfully. They have found that potato spraying pays. An indication of this may be seen from the cost figures from the 30 Monmouth County farms in 1926. On the farms that used Bordeaux mixture the average cost per bushel was 72 cents as compared with 84 cents on those farms which did not spray. Some of the growers who insisted that they would not bother to spray are still growing potatoes but it is safe to say that their returns are not as great as is the case of those who adopted spraying.

This is only one item—other methods of reducing production costs have been recommended from time to time. They have proven to be sound and it behooves every grower to adopt them. When this has been done there need be little fear concerning the failure of the New Jersey potato industry. The grower who is now planting 30 acres of potatoes, could, in many cases, produce just as many bushels with but a small additional cost on 25 acres. This is the point we should all aim at and when we have accomplished it we will then be able to put a high grade product on the market. There is no question but that low production costs plus high quality will place the New Jersey potato industry on a sound basis.

Red Skin Seed Potatoes

This past year as in preceding years a number of acres were planted with the Red Skin variety in South Jersey. In many of these fields as many as 90 per cent of the plants were seriously

affected with leaf roll. With the best growing conditions seed of this kind could not be expected to produce more than half a crop. It is obviously impossible to expect returns from fields of this kind. In most cases this seed is so badly diseased that attempts to improve it would meet with failure. The Red Skin growers should do one of two things, either discontinue growing the variety or replace it with new seed. A supply of high class seed is now available. Four years ago on the Will Raabe farm in Camden County several hundred hills were selected for freedom from leaf roll. This seed was planted in tuber units the following year and all units showing any signs of leaf roll were pulled out and destroyed. The next year sufficient seed was available to plant several acres by the tuber unit method. This was again carefully rogued and was found to be sufficiently free from disease to be certified. In 1928 Mr. Raabe planted 5 acres, all in tuber units, and in addition, a small acreage of this same seed was planted at Del-Bay Farms, Bridgeton, and by G. A. Siebke, Riverton, and H. D. Culin, Hainesport. On all of these places the seed was found to be relatively free from disease and was certified. On the S. W. Ruhl farm, near Bridgeton, three acres of Red Skins were planted with seed certified in 1927. This field was rogued hard this year and should make

good seed. In those cases where leaf roll was prevalent this year it would be highly advisable that the grower discard his own seed and replace it with seed which will result in higher yields.

Annual Meeting

The Annual Meeting of the Potato Association has been called for Thursday, Jan. 17th, during Agricultural Week at Trenton. The potato show will be held in the Armory as usual and it is hoped that the growers will select exhibits for the show. The program arranged for Thursday should be interesting and instructive. Among the topics to be discussed are, cost of production, concentrated fertilizers, management of potato soils, spraying, potato pickers, cultivating by power, etc. In addition, a report will be presented on the action taken by other potato growing sections to better conditions in the industry. Thursday evening the Annual Banquet will be held at the Hotel Sterling and on Friday morning there will be a round table discussion of potato production methods in the Armory. This was attempted last year and met with such success that it was decided to repeat it this year. The potato meeting has always been well attended in the past, and, with an interesting program, the crowd should be larger than ever this year.

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 8

NEW BRUNSWICK, N. J.

December, 1928

ANNUAL MEETING

Y. M. C. A.

Thursday Morning, Jan. 17

CHAIRMAN, CHAS. B. PROBASCO, PRES.

- 9.45. How Diversification Has Helped the New Jersey Potato Farmer. A. G. Waller, N. J. Agr. Exp. Sta.
- 10.15. Potato Growing in Long Island and New Jersey. H. R. Talmage, New Jersey and Long Island Potato Grower.
- 10.45. Results with Concentrated Fertilizers in 1928. Dr. W. H. Martin, N. J. Agr. Exp. Sta.
- 11.15. Soil Problems for Potato Growers. Director J. G. Lipman, N. J. Agr. Exp. Sta.
- 12.00. Announcements and Appointments of Committees.
- 12-1.35. Examination of Exhibits in Armory.

Thursday Afternoon

- 1.35. Reports of Committees.
- 1.45. The Virginia and Chicago Potato Conferences—How Will Their Recommendations Affect the New Jersey Potato Grower? W. O. Strong, Virginia. W. W. Oley, Bureau of Markets, N. J. Dept. of Agr.
- 2.45. How Can Potato Production Costs be Reduced?
 - 1. The Possibilities of the Mechanical Picker. Wm. Clayton, Freehold.
 - 2. Cultivating with Power. C. C. Snyder, Hightstown.
 - 3. Spraying with Power. Isaac Harrison, Gream Ridge.
 - 4. Reducing Fertilizer Costs. Chas. B. Probasco, Hightstown.
 - 5. What Monmouth County is Doing. Ellwood Douglass, County Agent, Monmouth County.
 - 6. What the 300 Bushel Club Members Did. H. R. Cox, N. J. Agr. Exp. Sta.
 - 7. What the South Jersey Potato Growers Are Doing to Improve Their Seed. J. C. Crissey, South Jersey Seed Grower.
- 4.15. Meeting of the Executive Committee.

Thursday Evening

Banquet

- 6.30. Hotel Sterling.
Presentation of Medals to Members of 300 Bushel Club.
Dancing.

Friday Morning, Jan. 18

Potato Exhibit—Armory

- 9.45-12.00. The Following Topics will be Discussed.
 - 1. Potato Grades and Grading.
 - 2. Latest Information on Potato Spraying.
 - 3. Up-to-date Information on Seed Disinfection.
 - 4. Soil Acidity and Potato Production.
 - 5. Developing Home Markets for New Jersey Potatoes.
 - 6. The Seed Potato Situation.

The Chicago Meeting

The local growers are aware that a conference of those interested in the potato industry was called at Chicago on December 4 and 5. At this meeting the industry was considered from a national standpoint but every potato grower should acquaint himself with what took place. A very good summary of the discussions appeared in a recent issue of the "Colorado Potato Grower." This was written by D. W. Aupperle, President of the Colorado Potato Growers Exchange.

"After going over every phase of the present situation, the National Potato Conference, held in Chicago December 4 and 5, to consider marketing possibilities of the 1928 crop and to study the future outlook of the potato industry, placed the responsibility for the deplorable state of affairs in the spud industry chiefly upon over-production.

The conference, which was called by the Agricultural Council of the Central Western Shippers' Advisory Board, was an outgrowth of the meeting at Pocatello, Idaho, in September. The Chicago meeting was well attended by representatives from every branch of the industry, including both growers and shippers, brokers, Directors of Markets from a number of states, railroad agricultural agents and others. The meeting is said to have been the largest ever held solely by potato men, there being 222 registered delegates representing 44 states. The government Department of Agriculture and Department of Commerce were well and ably represented at the conference. These representatives were first called upon to discuss the various features of government activities in connection with crop production, crop reports, market reports, uses made of crops, etc.

A survey of the potato situation from all its angles left no room for doubt that the 1928 production is far above the normal demand. Efforts have been made and are still actively under way to dispose of the surplus. Low grade potatoes are being fed to stock in large quantities. It was expected that the low price prospects would result in many potatoes being left unharvested, but good weather conditions in all sections encouraged digging and not many were left in the fields.

There is a general feeling, however, that the crop estimates are too high. It appears also that in some important sections the potatoes are not keeping well. There is some hope that the January storage crop estimate may show some reduction in the supply of marketable potatoes. This may strengthen the market some, but there is at this time no prospect for high prices. Low prices have not increased table consumption. The shipment of potatoes is much lighter this year than in previous years.

1929 Potato Outlook

The outlook for 1929 was broadly discussed. Some argued that the producers of the country must experience one more year of low prices before they will reduce their plantings to a proper basis. Others believe that if the facts are placed before the growers they will adjust their plantings in 1929 to meet the normal demand. There is but little chance that the plantings will fall below normal.

There are a few facts which the potato producers of the United States should study. The potato is one of the three largest food crops. The potato industry will continue to be an important one whether the grower makes a fair profit each year or not. It would be much better for the grower and his community if he could have a fair average price each year rather than to make a large profit part of the time and take a loss the rest of the time.

Taken as a whole, the potato producers have in the last ten years had four good price years and six low price years. The average annual demand for potatoes is about 360,000,000 bushels. In 1926 we planted 3,151,000 acres and harvested 356,000,000 bushels. There was a demand for the entire crop, prices were good, growers made a fair profit, consumers were satisfied with prices and potato growing communities prospered.

In 1928 we planted 3,843,000 acres. The yield is estimated at 465,000,000 bushels. It is conservatively estimated that there is an actual loss of more than two hundred millions of dollars on the 1928 potato crop. This loss applies not alone to the growers but it affects every potato growing business community. This loss could have been

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turned into a profit if 20 per cent less potatoes had been planted. The 1926 crop was worth to the growers, based on the farm value at the farm on December 1, according to government estimates, \$501,000,000. The 1928 crop will probably show a value less than half that amount.

Farmer Can Prevent Surplus

Think this over. Talk it over with your neighbors, with your bankers, with your business men, then get together and together plan your acreage plantings for 1929. If the growers will give more consideration at planting time to the matter of surpluses there will be less worry at harvest time.

The regular, the practical grower should not, must not, quit the game, but the purely speculative planter should get out and stay out. He does no good to himself and he disturbs a very important industry.

The Chicago Conference recommended a reduction of 20 per cent from the 1928 acreage. That means that if you planted 20 acres this year you should plant 16 acres next year. You had better make a profit on 16 acres than suffer a loss on 20 acres.

It is expected that a national potato

association shall be organized as soon as conditions warrant doing so. The Chicago conference passed some practical resolutions which are printed below. Study them, but remember also that reading them will do but little good unless you help to put them in practice.

1. "Resolved, that this meeting go on record as urging the increase of the existing duty on potatoes imported from any foreign country to the United States to \$1.00 per 100 pounds, with a provision for an advalorem duty in excess of a stipulated minimum."

2. "Resolved, that this meeting go on record as endorsing a Federal license law regulating and supervising wholesale produce dealers, the principles of which are outlined in Senate Document S-1294, commonly known as the 'Borah Bill'."

3. "Resolved, that this meeting urge a reduction of ten to twenty per cent potato acreage for 1929 through the National and State Departments of Agriculture, and all other existing agencies, including banks, fertilizer companies, and related interests."

4. "Resolved, that this meeting go on record as being in favor of the grades for potatoes now known as United States Graded."

5. "Resolved, that this meeting endorse National shipping point inspection of potatoes to conform to the grades already established by the United States Department of Agriculture."

6. "Resolved, that this meeting go on record as urging the increase of the existing duty on potato starch imported into the United States from foreign countries to \$3.00 per 100 pounds, and on dextrine to \$4.50 per 100 pounds."

7. "Resolved, that this meeting go on record as in favor of compulsory branding or tagging of all potatoes shipped, showing weight and grade in accordance with the grades now established by the United States Department of Agriculture."

8. "Resolved, that the National Potato Committee appointed by this meeting, be asked to confer with the Crop Reporting Section of the Bureau of Agricultural Economics, United States Department of Agriculture, relative to improvements that might be made in the service."

9. "Resolved, that the most apprecia-

tive thanks of this meeting be extended to The Agricultural Council of the Central Western Shippers' Advisory Board for their generous labors in sponsoring, organizing and conducting this constructive and important conference."

10. "Resolved, that the heartfelt thanks of this meeting, and each individual thereof, be extended in sincere appreciation to our kindly, able and efficient Chairman, Mr. R. E. Shepperd."

11. "Resolved, that this meeting go on record urging the United States Department of Agriculture, State Department of Agriculture, County Agents, Agriculture Instructors, and every organization represented here to learn all facts concerning the value and factor of feeding potatoes to live stock, especially hogs."

(Signed) COMMITTEE ON RESOLUTIONS AND RECOMMENDATIONS.

By J. C. Briggs, Chairman.

The exhibit in the Armory promises to be the most interesting shown any Farmers' Week. Secretary Duryee reports that there will be a number of pieces of machinery on display, which will interest the potato growers. Among the exhibits will be, diggers, graders, sprayers, dusters, planters, seed cutters and possibly mechanical pickers. This exhibit, together with the program arranged for the Annual Meeting, is well worth a trip to Trenton. This will be a good time to have your potato problems answered. If you have questions on seed, disinfecting seed potatoes, fertilizers, cover crops, spraying, grading, etc., there will be someone present at the meeting who can answer them.

Costs in Producing Potatoes

ALLEN G. WALLER

The average wholesale prices for New Jersey Cobbler potatoes on the New York market according to the Producers' Price Current, were the lowest since 1915 with the exception of 1922. The condition of low prices for agricultural products always leaves in its wake certain ill effects for the producers of the particular product, and especially for those growing the crop inefficiently or at a high cost per unit.

New Jersey producers have not been the only ones afflicted with low prices this year, and while this is no particular consolation, still the effect of low prices in one year has very often had a corrective effect on production for the succeeding year. This is indicated in the cycles of acreage and production of many agricultural products when associated with prices received. The opposite effect takes place, usually leading to overproduction, when prices are high. In the long run it is the efficient producer who pulls through and it is the same man who sees to it he is producing what the market wants, and who is taking every precaution to safeguard his investment in the crop. These precautions include all the known economical methods of obtaining a high yield of a marketable product.

The potato crop as grown in Central Jersey represents a large investment with the unknown factor of the weather and what the price received is to be. Therefore, it is all the more important that special care and thought be taken as to where and how much the acreage shall be. The following tables indicate how large an investment was used in growing an acre of potatoes in Central Jersey on the numbers of farms indicated for the two years 1926 and 1927.

Acre costs of growing potatoes on farms included in surveys:

	1926	1927
No. of farms	30	40
Acres of potatoes	965	1293½
Seed cost	\$34.91	\$39.23
Fertilizer	33.07	32.33
Man labor (inc. operator)	34.40	30.60
Horse labor	13.12	11.84
Machine labor (inc. tractor and truck)	10.82	9.75
Land rent	15.60	15.79
Other costs*	17.99	20.29
Total cost per acre.....	\$159.91	\$159.83
Average yield per acre (bushels)	205	219
Average cost per bushel	\$0.78	\$0.73
Per cent of man labor hired	72	79
Average yield per acre..	205	219
Lowest yield per acre...	136	128
Highest yield per acre..	290	287.5

*Includes cover crop, containers, seed treatment, manure, spray materials, interest, insurance, storage, and miscellaneous.

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 9

NEW BRUNSWICK, N. J.

January, 1929

Growing Potatoes on Long Island and New Jersey

H. R. TALMAGE.

The New Jersey potato growers will be interested in hearing something of the conditions and methods of growing potatoes on Long Island, because we are your neighbors, and we are always interested in our neighbors affairs.

We estimate that there are at least 40,000 acres of potatoes grown on the Island, of which 30,000 are grown in Suffolk Co.

The important potato section of Suffolk Co. is located 70 to 100 miles from New York. Very little of its crop is hauled to the market by trucks. There were nearly 9,000 carloads of the 1927 crop shipped by rail. Our good potato farms are selling for a thousand dollars per acre, and these farms are entirely out of the speculative, building lot area. I am not at all certain that such prices are justified by the probable returns. We are at the limit of the possible acreage. There may be a slight increase from lands being cleared out of the woods and planting some of the marginal lands, ordinarily considered too light for safe potato growing.

In New Jersey and on the Island the soils are classed the same, sassafras loam. The Island soils are more friable, more easily worked. We almost never have to do any fitting of our land for potatoes. When it is turned over by the plow it is in as good condition for planting as it can be.

Many of our small farms do not have an acre of hay or grain of any kind on them, except possibly a little corn on some of the lighter spots. This naturally makes horse feed much higher than

with you, making the cost per hour of horse labor considerably higher.

Decrease in horses used and an increase in tractors, has been very marked of late. We have a considerable number of farms where they grow 50 to 100 acres per year that have no horses, the entire job being done with trucks and tractors of various kinds. No doubt the change will go on rapidly, and it will be but a short time before horses, even on the farms will be something of a curiosity. Costs will eventually be the determining factor.

With the overhead of \$75.00 per acre, made up of interest, taxes and building repair, we have to grow some crop that can, under favorable conditions, pay such a high rental. That of course eliminates such crops as rye, hay, corn and many others. We have to grow potatoes or some other vegetable crop in order to pay our rent. This means of course that we have to plant potatoes continuously on the same land.

We are at another disadvantage from our location. Everything we use in our farming operation is subject to an additional freight rate; unless it originates in New York City. Seed potatoes and fertilizer alone would account for an additional cost to the Island grower of \$3.00.

Another item in the cost of growing potatoes is labor. With us this is higher than any other farming section in the country, so far as I can learn. First class farm hands, married who board themselves are getting \$115 or \$120 per month, house rent, milk, wood, potatoes,

etc. For several years past the average cost of our labor on our own farm, including some boys labor at 35c per hour has been a little over 50c per hour. One result of the high wages we pay has been that there is an abundance of good labor.

So far I have touched upon some of the differences that enter into the production of potatoes on the Island and New Jersey. You will have noticed that in every case where there is any advantage it is on the side of New Jersey. In some instances the difference is marked. Your overhead on the price of your potato land is much less. Your labor costs are materially less. You make the rye crop pay the cost of your cover crop, an item with us of \$3.50 per acre. As a matter of fact every element in the cost of growing potatoes is in favor of the Jersey grower except that of fitting the land. Your soils here need a little more fitting.

I have just mentioned the item of freight rates. The costs of our raw materials amounts to more than one cent per bushel. It is on the saving in freight that you get a very big advantage of the Island grower. This saving to you is about 25c per bag or 10c per bushel. That item alone would make the difference between profit and loss in many a year. The trouble with you is that you do not cash in on it. You do not cash in on any of your advantages and opportunities.

Why This Difference?

We are now getting to the interesting, the important part of this discussion. I know, at least I think I know, and am going to tell you.

You may disagree with me but I believe that the reason is **QUALITY OF PRODUCT**. When you come to analyze what makes quality of product, it seems to me that pretty near 95% is due to looks. The things that make a quality potato are that they cook well, that they be well grown on suitable soil, that they be carefully handled and above

all that they be well sorted. Of the required qualities sorting is all important. I care not how good a lot of potatoes may be in all other respects, if they are not well sorted they will have to go to a cheap trade for a cheap price.

There have been times during the past few months when Idaho potatoes were selling for almost as much F. O. B. as the New Jersey potato. There is just one reason. When they bought the Idaho potato they knew what they would get. When they bought the New Jersey potato they did not know what they would get.

The Long Island potato grower has prospered because of the extra quality of his potatoes and the dealers have always sorted better than U. S. No. 1. Due to a fight among the dealers the 1927 crop on Long Island was sorted over the one and three-quarter inch screen instead of the inch and seven-eighths. That fight cost the Long Island growers nearly a million dollars. It cut the price the grower received from ten to twenty cents per bushel. On account of poor sorting, our fancy trade that we usually have in Philadelphia, Newark, Paterson and many other markets were closed to us, they used Idaho potatoes instead. You New Jersey growers with your natural advantages of soil, climate and wonderful and unlimited markets, allow other potatoes to come in and skim off all the cream of the market and you cater to a cheap trade much of the time. There is no doubt but that many of your potatoes go to market well graded. Unfortunately, however, a market seems to judge the quality of a product from a certain locality by the poor goods that come from that locality rather than by the best goods.

It seems a strange condition that your close proximity to such splendid markets should actually work out to your serious disadvantage and loss. The independent truckman, with no reputation to lose, and a willingness to take ungraded potatoes, is a serious detriment

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WALTER L. MINCH, Bridgeton,
Treasurer

J. Gilbert Borton, Frank Ott, 3 years;
H. E. Hulshart, Wm. Clayton, 2 years;
Geo. R. Waln, A. W. Gertzel, 1 year.

to the New Jersey potato industry. Our Long Island farmers refuse to sell to the independent truck men. They sell only to the regular buyers. The buyers know the importance of keeping their markets and also know that their prosperity is closely tied up with the prosperity of their growers and are anxious to return to the growers just as big a price for their potatoes as possible.

There is a remedy. If all the farmers would haul their potatoes to the dealers and have them sorted by the dealer who is to market the potatoes, it would easily be worth a million dollars a year to the growers of this State. The dealer should not make a separate charge for this sorting. All trucks should be sent to the dealers for their supplies. This would insure only well sorted potatoes going to market and it would be reflected right back in an increased price to the grower. Probably as the Chain stores acquire nearly the entire retail outlet for potatoes the situation

may improve, as they will only buy through regular channels and only potatoes of a good standard of grading.

To summarize, the Long Island growers have prospered because of the high quality of their product. Their costs are very high, but the prices received, due to quality, have more than overcome this high cost of production. The New Jersey grower has every advantage in costs and location, with the same markets more accessible. To date, they have not been able to turn these advantages into money, due principally to the fact that the New Jersey potatoes as sent to market have not been properly graded.

OFFICERS FOR 1929

At the Annual Meeting the following officers were elected to serve during 1929: Chas. B. Probasco, President; Alfred E. Sloan, Vice-President; Wm. Clayton, Secretary; Walter L. Minch, Treasurer; Wm. H. Martin, Corresponding Secretary; members of Executive Committee, James Ewart, H. E. Hulshart, 2 years; Clifford E. Snyder, Theron M. McCampbell, 1 year. All of these men have been active in the Association in past years and will give of their time to advance the interests of the potato industry in 1929.

POTATO SHOW AWARDS

Late Crop Cup
Cumberland Co.

LATE CROP COBBLERS

Salem County

Gold Medal, Alfred Sloan.
1st Prize, Linwood Patrick.
2nd Prize, C. N. Bishop.
3rd Prize, Russel B. Harris.
4th Prize, Oscar Simpkins.

Cumberland County

Silver Medal, John Coles.
1st Prize, Charles Hetzell.
2nd Prize, S. U. Ruhl.
3rd Prize, J. Norton Woodruff.
4th Prize, Melvin Ruhl.

Cumberland County Vocational School

- 1st Prize, Jack Mixner.
- 2nd Prize, Albert Mixner.
- 3rd Prize, Francis Hetzell.

Cape May County

- 1st Prize, F. Dickinson and Son.
- 2nd Prize, F. Dickinson and Son.
- 3rd Prize, George McNeill.
- 4th Prize, A. H. Reeves.

LATE CROP GREEN MOUNTAINS

Cumberland County

- Gold Medal, Floyd Harris.
- 1st Prize, Harold Ott.
- 2nd Prize, Walter L. Minch.
- 3rd Prize, John Harris.
- 4th Prize, David McPherson.

COMMERCIAL COBBLERS

Salem County

- Gold Medal, Alfred E. Sloan.
- 1st Prize, Harry Featherer.
- 2nd Prize, F. Marvin Coombs.

Mercer County

- 2nd Prize, H. E. Hulshart.

Cumberland County

- 1st Prize, Howard Padgett.
- 2nd Prize, Ed. English.
- 3rd Prize, Frank Ott.
- 4th Prize, Allan Ackley.

Monmouth County

- Silver Medal, George R. Smith.
- 1st Prize, Wm. R. Conover.
- 2nd Prize, A. H. West.

**COMMERCIAL GREEN
MOUNTAINS**

Monmouth County

- Silver Medal, George R. Smith.
- 1st Prize, A. H. West.
- 2nd Prize, Charles Satterthwaite.

Cape May County

- 1st Prize, A. H. Reeves.
- 2nd Prize, S. B. Taylor and Son.

Mercer County

- 1st Prize, A. E. and G. C. Snook.
- 2nd Prize, H. E. Hulshart.

Middlesex County

- 1st Prize, Spencer Perrine.

MISCELLANEOUS

Cumberland County

Silver Medal, Walter L. Minch, Red Skins.

- 1st Prize, Billie Ott, Red Skins.
- 2nd Prize, Del-Bay Farms, Inc., Red Skins.
- 3rd Prize, Harold Ott.
- 4th Prize, Frank Ott.

Cumberland County Vocational School

Gold Medal, Malcom Cramer, Red Skins.

- 1st Prize, Clarence Johnson, Golden Surprise.
- 2nd Prize, Henry Renne, Golden Surprise.

Salem County

- 1st Prize, John Shimp, Red Skins.

Cape May County

- 1st Prize, S. Compton and Son, Red Skins.
- 2nd Prize, Richard Smith and Son, Red Skins.
- 3rd Prize, S. Compton and Son, Superba.
- 4th Prize, J. C. Elliott and Sons, Superba.

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 10

NEW BRUNSWICK, N. J.

February, 1929

The Potato Outlook For 1929

In recent years the Staff of the Bureau of Agricultural Economics has prepared an Agricultural Outlook for the year. In view of the fact that this has proven to be very accurate the past two years it would pay every potato grower to give this year's outlook serious consideration. This has been presented in part in other places but in order to be certain that every potato grower has an opportunity to see it, the complete report is presented here.

It will be seen that the present information indicates a yield of approximately four hundred million bushels of potatoes next year. This is well under last year's total production but at the same time the reduction is not great enough to ensure high prices. In the past 10 years, for example, there were 6 years when the total production was over 400,000,000 bushels. The average Dec. 1 price in these 6 years was 77 cents as compared with \$1.49 for the four years when production was under 400,000,000 bushels. It is obvious that it will not pay to speculate with potatoes this year.

Read the following report carefully and then plan accordingly. When you have decided on the acreage you wish to plant—see to it that every step is taken to keep production costs as low as possible. More will be said about this in the next issue of "Hints."

"Potato growers in nearly all parts of the United States suffered such terrific losses from overproduction in 1928 that there is little probability that an excessive acreage will be planted this season. Preliminary reports on the acreage which growers intend to plant

indicate that, if the crop is given average care, production in 1929 may be expected to vary from 400,000,000 bushels about in proportion that growing conditions are more favorable or less favorable than usual. Considering the low cost of seed potatoes this season, this prospect need not discourage efficient producers of late potatoes, but it does not encourage speculative plantings. Heavy stocks now on hand will tend to hold down the price of new potatoes until the end of June, so prospects for southern growers are none too bright, even though their acreage is reduced around 25 per cent, as now seems probable.

Acreage planted to potatoes is so little dependent on weather conditions at planting time that the acreage planted has not usually differed far from what farmers report as intended. Two years ago the January reports indicated an intended increase in plantings of 13 per cent. Abandonment from flood, hail, and blight was rather heavy, and the increase in the estimated harvested acreage was 11.3 per cent. In January, 1928, an intended increase of 7 per cent in plantings was reported and the acreage available for harvest was increased about 10 per cent. Reports this year seem to indicate that growers are now planning to plant an acreage 11 per cent smaller than they planted last year, indicating the probability of a harvested acreage slightly below that of 1927. As this indicates about average prospects, there is no reason to expect farmers to make material changes in their plans between now and planting time.

In estimating the acreage of potatoes

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needed next season, allowance must be made for the upward trend in yields that is resulting from more intensive methods of production. If average weather conditions are experienced this season, and yield follows the trend of recent years, a yield of about 117 bushels per acre must be expected. If this yield is secured on an acreage 11 per cent below that available for harvest in 1928, production will be around 400,000,000 bushels, and supplies after July 1 will be about equal to the average during the last 10 years. In considering prospects for next year it should, however, be borne in mind that yields have often been relatively low when seed has been cheap and potato growers discouraged. This year farmers are planning to use a little more seed per acre, but the crop may not receive the usual attention.

While the indications of intended acreage are, of course, only approximations, they are sufficiently uniform to indicate that the principal reductions in acreage are to be expected in the early

States, in the commercial sections of the second early States, that is, Virginia, Maryland, Oklahoma, and Kansas, and in the important potato area extending from Michigan to North Dakota. Substantial reductions are also to be expected in Idaho and Colorado. Maine reports a decrease of about 8 per cent and New York a decrease of 4 per cent, but there are as yet no indications of any reduction in the acreage in Indiana, Ohio, Pennsylvania, and West Virginia, Nebraska, South Dakota, and a few other scattering States are planning slight increases. On the whole, the acreages reported as intended in the late potato States seem well balanced. The Eastern States indicate only slight reductions in the intended acreage of late potatoes, for yields there have been increasing and, because of the local markets, commercial growers seem to have succeeded in securing fair returns even in some years of rather low prices. This large acreage close to the markets justifies the decreases reported as intended in the commercial late potato areas farther west, where the depression this season is most severe.

The early potato States that market before July have a real problem this year. On January 1 merchantable stocks in hands of growers and local dealers were close to the record January holdings of six years ago, being estimated at 131,000,000 bushels compared with about 100,000,000 bushels last year. To permit early potatoes to sell to advantage in competition with these storage potatoes, production must be reduced sufficiently to keep early potatoes in a luxury class. This was accomplished in the springs of 1923 and 1925, but, in each case, a radical reduction in acreage was necessary. This year, growers in these early States apparently intend to decrease their acreage 25 per cent. Such a reduction would relieve the situation somewhat, but would still leave prospects somewhat less favorable than usual.

Trenton's Carlot Potato Supply In 1928

WM. C. LYNN

Trenton unloaded 252 carloads of potatoes in 1928 compared with 163 cars the previous year. All but seven of these 252 cars arrived during the first seven months of the year. Two cars came from Maryland in the first few days of August, one from New York State in October and one from Pennsylvania in December. Three cars came from New Jersey in September and October but were for institutional use and therefore did not move competitively through the usual wholesale channels. This shows, therefore, how completely the Central Jersey potato section met the needs of Trenton and vicinity after the first of August.

To go back to the Spring of 1928, fairly high prices during this period brought in more than 100 cars of late potatoes from various sources. Most important among these was Maine which shipped in 41 cars compared with 42 from that State the previous year. These were well distributed over the period from January to May inclusive and during these months sold at wholesale from \$3.75 to \$5.25 per 150-lb. sack, averaging for the most part around \$4.50. The freight amounted to 90c per sack on all receipts from the Presque Isle section.

New York and Pennsylvania contributed 25 and 15 cars respectively, practically all of which were Spring receipts. This amount from Pennsylvania was the same as in 1927, but the New York receipts were three times as heavy as in 1927. The majority of the New York stock was in reality Long Island, which increased steadily in price on the local wholesale market from \$4.00-\$4.50 in January to \$5.25-\$5.50 per 150-lb. sack in March and April.

Attracting the most attention is the fact that thirteen carloads of Idaho potatoes were unloaded in Trenton in the Spring of 1928. This quantity total-

ed more than 8,000 bushels which were on hand in carlots for four months beginning with February. The freight on these receipts was at the rate of 72c per bushel from Pocatello and Idaho Falls, or equivalent to \$1.80 on the basis of our more familiar 150-lb. sack which is not used in that section. Stock was generally of good quality and sold rather uniformly through the season at \$3.00-\$3.50 per 110-lb. sack wholesale.

Nearly twice as many Southern potatoes arrived by rail as in 1927, bringing with them the low prices which began at that time of the year. The five coast States from Florida to Maryland, not including Georgia which is relatively unimportant as a potato producer, shipped 144 cars of new potatoes into Trenton. Practically all of these came in during June and July, and three-fourths of these receipts were from the Carolinas and Virginia. Approximate freight rates to Trenton were 54c per barrel from Exmore, Va.; 65c from Elizabeth City, N. C.; and 87c from Meggetts, S. C.

Total carlot receipts of potatoes in Trenton in 1928 are as follows: (figures in brackets are 1927 receipts): Florida, 18 (11); Idaho, 13 (0); Maine, 41 (42); Maryland, 20 (11); Michigan, 2 (0); New Jersey, 5 (7); New York, 25 (8); North Carolina, 39 (23); Pennsylvania, 15 (16); South Carolina, 25 (10); Virginia, 42 (15); unknown, 7 (20). Total, 252 (163).

The 400 Bushel Club in Pennsylvania

Each year since its inception the methods employed by the members of the 400 Bushel Club in Pennsylvania have been summarized by J. B. R. Dickey. During the past year 377 Pennsylvania growers produced more than 377 bushels per acre. Of these, 10 produced more than 600 bushels per acre

and 81 over 500 bushels. The highest yield, 696 was produced by H. J. Walton and Sons in Chester County. The methods employed by the 400 bushel club members follow:

Varieties. 92% of the club members grew the Rural Russet variety. Eighteen planted Green Mountains and 10, Irish Cobblers.

Spacing and Depth. Closer spacing is the tendency. In 1926 the rows averaged 32.4 inches; in 1927, 31 inches; and in 1928, 30.95 inches. In the latter year the 500 bushel club men averaged 30.4 and the 600 bushel men 29.4 inches. Thirty inches appears to be as close as the rows should be planted since when closer than this difficulty in cultivation, digging and spraying is likely to result.

In 1926 the spacing in the row averaged 11 inches; in 1927, 10.5, and in 1928, 9.75 inches. The men who made 500 bushels averaged 9.5 while those who produced 600 bushels averaged 9.2 inches. In Lehigh County the average rows were 31.7 inches and the average planting distance 10 inches. As Dickey points out, close planting does not always ensure high yields since if the soil is poor and the crop not properly cultivated a high percentage of small tubers is likely to result.

Rotation. 89% of all the fields making 400 bushels followed a legume. In the 500 bushel class 95% followed a legume as did 9 of the 10 in the 600

bushel class. Of the whole group only 5% used corn stubble in 1928 compared to 8% in 1927, while 5% planted on timothy sod compared to 12% the previous year.

Cultural Operations. 77% of the entire group reported the use of the harrow after planting. The average number of harrowings reported was 23 times. A weeder was used on the 600 bushel crops an average of 5.8 times, on 95% of the 500 bushel crops an average of 5.1 times and on 87% of the total an average of 4.2 times.

Spraying. All of the 400 bushel crops were sprayed, with one exception, this was dusted. In this connection it is of interest to note that 802 growers have made the 400 bushel club in Pennsylvania since it was started. Of this number only 4 crops were produced without spraying or dusting. There is food for thought for all potato growers in this. The 600 bushel men sprayed an average of 13.7 times, the 500 bushels men, 12.8 times, and the entire group averaged 11.3 times.

Fertilization. About 80% of the club members reported using manure with an average application of about 11 tons per acre.

The average fertilizer application was 1175 pounds per acre. In this connection it is of interest to note that the record breaking acre received only 600 pounds of a 4-8-7 fertilizer per acre.

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 11

NEW BRUNSWICK, N. J.

March, 1929

The 300 Bushel Club of 1928

A. G. WALLER

With the season of 1928 gone but not forgotten, 1929 is at hand and the serious business of growing potatoes for profit or loss during this season is to be taken up, so it ought to be worth while to every potato grower to consider carefully where, when and how he is going to grow his crop this year. For this reason the following description is given of the methods and costs obtained from the eighteen growers who made the 300 bushel club of 1928.

These eighteen growers were distributed by counties, as follows: Salem 5, Middlesex 5, Mercer 3, Monmouth 2, Burlington 2, Warren 1.

The following table gives the costs per acre, in detail, for the more important items:

Seed Cost (17 bushels).....	\$30.24
Fertilizer (2147 pounds)	35.58
Man Labor—inc. operator—(131.4 hrs.)	48.35
Horse Labor (99.5 hours).....	18.91
Machine Labor (inc. tractor and truck), (105.6 hours)	14.54
Land Rent	15.31
Other Costs (containers, spray materials, manure, etc.)	29.11
Total Cost per Acre.....	\$192.04

The average yield per acre was a total of 393 bushels made up of 368 bushels of firsts (U. S. No. 1) and 25 bushels of seconds. Based on the total yield the cost per bushel was 48.8 cents; and crediting the crop with the value of the sec-

onds, the cost of producing a bushel of firsts was 30.5 cents.

The average net profit per acre was \$30.57 on these eighteen pieces of ground that made the 300 bushel club. This profit, in the face of a price condition that will long be remembered, should be an answer to those who question the educational measures now advanced, but who do not fully take into account the fact that they are devoted not at all to obtaining larger total production but only towards more efficient production. Aside from the problem of efficiency in production, there is the problem of sound marketing policies which should be developed through the cooperation of the growers and buying agencies.

The following brief statements indicate some of the methods found on these eighteen farms.

Varieties. All but one of these eighteen were growing Cobblers, and that one planted Rural Russets.

Sources of Seed. Of the 17 Cobbler growers, 8 used P. E. I. seed on the measured 3 acres, 4 used South Jersey, 2 Vermont, 2 New York, and 1 both P. E. I. and Maine. The South Jersey seed was of course not certified; most of the other seed was certified. The Rural Russet man used uncertified seed from a New York grower of dependable stock.

Amount of Seed per Acre. An average of 17 bushels per acre of seed was used. In 1927 the average for the winners in the contest was 16 bushels. This is slightly larger than the average of most growers, and ought to be noted.

Hints to Potato Growers

Published monthly by State Potato
Association

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New Brunswick, N. J.
Corresponding Secretary

Membership dues.....\$1.00 per year

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year.

Seed Treatment. Of the 18 growers, 16 practiced seed treatment at the small cost of \$.85 per acre for the material. Surely an inexpensive practice and a good investment.

Spraying. Of the 18 men, 17 sprayed with Bordeaux, the other man dusting his crop. The high man in the contest sprayed 10 times with Bordeaux. The number of sprayings varied from 2 to 10, the average number being 4.4. The average cost for spraying materials was \$4.62 per acre, the labor cost \$3.77 per acre, or a total cost of \$8.39 per acre for spraying. It has been proven time and time again that the small expenditure needed for spraying is profitable.

Fertilizer. Seventeen of the growers used an average of 2147 pounds of fertilizer per acre at an average cost of \$35.58. One man used concentrated goods at the rate of 666 pounds per acre. Fifteen of the men used the following analyses:

3 growers used	5-8-7
2 " "	5-8-6
2 " "	4-8-8
1 " "	5-5-9-9
1 " "	5-10-8.75
1 " "	5-8-7.5
1 " "	5-8-5
1 " "	4.5-8-8
1 " "	5-8-6 and 5-8-7
1 " "	4.5-8-8 and 5-8-7
1 " "	15-30-15

It should be noted that some of these men were using more fertilizer per acre than the average.

Cultivation Including Weeding. The number of cultivations varied from 2 to 8, the average number being 6. Slightly over a day's man labor was spent per acre on the average.

Use of Cover Crops, Sod and Manure.

Seven men plowed down a cover crop.

Two plowed down a cover crop and manure.

Seven plowed under manure without a cover crop. Of these 7, 2 plowed down corn stubble and either 4 or 5 plowed down a sod.

Two used neither cover crops nor manure. One of these plowed down a sod, the other a rye stubble.

The cover crops used by the 9 men were as follows: Rye 6, Clover 2, Wheat 1.

Seven of the 18 growers carried on some dairying.

In considering the problem of keeping up the soil fertility, it is worth while noticing some of these varying conditions:

Summary: Plowed down cover	
crops	9
Plowed down ma-	
nure	9
Plowed down sod..	5 or 6
Plowed down rye	
stubble	1

Man labor was by far the largest single item of expense with these growers, be-

ing \$48.35 or about one-fourth of the total acre cost. Treating, cutting and planting seed averaged about seventeen hours per acre, spraying on the average of 4.4 times required about five and a quarter hours, while the various kinds of cultivations (weeder, cultivator, hoeing) took about one and a quarter days.

Harvesting (digging, picking, sorting, and hauling to market) took a little over 8 days per acre.

Fertilizer was the next largest single item representing about 18 per cent of total cost per acre.

Seed cost was \$30.24 per acre or 15 per cent of all costs.

Growing the 1929 Crop

WM. H. MARTIN

Planting time is here. As growers, we must keep firmly in mind the fact that what we do now will be reflected in the crop we harvest. We have seen growers, this early in the year, do things which are certain to result in yield decreases. One grower was planting seed which was well supplied with the black sclerotial bodies of the *Rhizoctonia* fungus. This man may get away with this but he is certainly taking a chance which he can ill afford to take. He was influenced by a neighbor, three miles away. This man stated that seed treatment was of little value to him last year. Let us assume that he knew this to be true—what has that to do with conditions on another farm or with conditions in another year? It is unfortunate that some growers are so easily misled by the statements of men who very often are not qualified to make recommendations. Enough work has been done to demonstrate that seed treatment pays where the seed is infected with either scab or *rhizoctonia*. The additional cost per acre is small and is more than justified by the returns.

In another case a grower stated that in his opinion, 15 inches in the row was close enough to plant Cobblers. This man is wasting good land and fertilizer. In addition, if the season should be very wet he is likely to produce a large number of over-size potatoes. One or two other growers stated that they had previously planted 15 inches in the row but this year would plant 13 inches. There is no

question but that this will give them a larger yield and the potatoes will be a more uniform size. We believe that 11-12 inches would be even more desirable, and we are certain that in the very near future the New Jersey growers will be using this spacing. In those cases where the grower does not wish to change his planting distance he should at least increase the size of the seed piece. Seed potatoes are cheap this year and as the result, at least 1 sack more per acre could be used to good advantage in most cases.

Several other growers have advised us that they intend using more fertilizer this spring. One grower who averaged 300 bushels per acre on 60 acres last year stated that he planned to use an extra sack of seed per acre and increase his fertilizer from the 2000 pounds, used in 1928, to 2400 pounds. He estimates that this will increase his cost approximately \$10 per acre, but he feels that this will be a good investment. It is of interest to note in this connection that the members of the 300 bushel club in 1928 averaged a total yield of 393 bushels per acre. These men used an average of 17 bushels of seed per acre and an average of 2147 pounds of fertilizer per acre. That this was a good investment is clear from the fact that the 300 bushel club members produced the crop at an average cost of 49 cents per acre. It is true that other factors were responsible for the yields secured but the two mentioned were, without question, of very great importance.

In a year of this kind when the prospect for high prices is not particularly good, it is very essential that production costs be kept down. This is, of course, done through increasing acre yields. When the grower has bought the best certified seed, disinfected it when necessary, and taken every other possible step to ensure a good crop—and then sees it devoured by insects and diseases—he is not producing potatoes economically. Recently, one of the prominent potato growers of Central Jersey stated that he had demonstrated to his own satisfaction that spraying with Bordeaux mixture gave him an increase of 50 bushels per acre. If he sold his crop for \$2.00 a sack this increase would just about pay

all spraying costs as well as the fertilizer bill. In view of this fact, he feels that he cannot afford to neglect spraying. When more of the potato growers come to this realization they will be in better condition to meet low prices.

In many cases should the potato grower adopt the practices indicated above the acreage could be reduced 15 to 20 per cent without reducing total yield. This should receive serious consideration now. We cannot do much to influence prices but we can reduce our production costs and, after all, this amounts to the same thing. Produce at as low cost as possible—put up a good pack and the New Jersey grower need have no fear of what the future will bring.

HINTS TO POTATO GROWERS

New Jersey State Potato Association

Vol. 9, No. 12

NEW BRUNSWICK, N. J.

April, 1929

Potato Tests in 1929

WM. H. MARTIN

As in previous years the Experiment Station will conduct a number of tests with potatoes in various parts of the state. In order that the grower might have an opportunity to examine these a list of farms on which the work is being conducted is presented below. These growers will have an outline to show the arrangement of the plots and will be glad to go over them with you.

Fertilizer Studies

During the past ten years a series of fertilizer tests have been conducted in co-operation with the Bureau of Chemistry of Soils of the U. S. D. A. In the past this work included a number of different points but this year stress is placed on a comparison of the concentrated fertilizers. These tests are being conducted on the following farms.

James Ewart, Cranbury. This includes a comparison of 6 different concentrated fertilizer mixtures in comparison with a ton application of a standard 5-8-7 mixture.

Chas. B. Probasco, Hightstown. In this test a comparison is being made of a 5-8-7, 10-16-14 and a 15-24-21 applied at the rate of 2000, 1000 and 700 pounds respectively.

Spencer Perrine, Cranbury. In this test a 10-16-14 formula was applied at the rate of 600, 800, 1000 and 1200 lbs. per acre and a 5-8-7 mixture at double these amounts.

Wm. Clayton, Freehold. This test includes a comparison of nine different concentrated and a standard fertilizer mixture.

S. W. Ruhl, Deerfield. A large scale comparison is being made of three mixtures with the following analysis: 5-8-7, 10-16-14, and 15-24-21.

College Farm, New Brunswick. Two tests are being conducted here, one with concentrated fertilizer and the second a study of the influence of nitrogen, phosphoric acid and potash on size, shape and number of tubers.

Seed Treatment

Spencer Perrine, Cranbury. A test is being conducted with several organic mercury compounds and mercuric chloride to determine their value in the control of rhizoctonia. A similar test is being conducted at the College Farm, New Brunswick.

Soil Treatment

Andrew Schnetzler, Elmer. An extensive test is being conducted to determine the value of the addition of certain materials to the fertilizer for the control of soil borne scab and rhizoctonia.

Variety and Strain Tests

Spencer Perrine, Cranbury.

Ross Clayton, Freehold.

Alfred Sloan, Elmer.

On these three farms are planted 5 varieties from a number of different sources to determine the best yielding variety and source under New Jersey conditions.

Virus Diseases

Wm. Clayton, Freehold. Five varieties showing a number of virus diseases

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including leaf roll, mosaic, leaf rolling mosaic, spindle tuber, wire stem, witches' broom, and giant hill have been planted to acquaint the growers with these various diseases and also to serve as a nucleus for a conference of the seed potato certification authorities to be held in June.

Spraying

Several spray tests will be conducted. These will include a comparison of home made and commercial Bordeaux mixture, influence of pressure and a comparison of several materials which might possibly replace Bordeaux mixture.

Depth of Planting

James Ewart, Cranbury. In this test a comparison is being made of depth of planting, including $\frac{1}{2}$, 1, 2 and $2\frac{1}{2}$ inches.

Distance of Planting

James Ewart, Cranbury. A comparison is being made of 9, 11, 13 and 15 inch plantings in 32 inch rows.

All of these tests are being conducted for the growers' information. It will repay you to follow this work since the ultimate aim of all of these tests is the production of better potatoes at lower costs.

POTATO CHIPS

In Cuba, potatoes are planted by the aid of a pair of oxen, a wooden plow and good Cuban sweat! Much of the latter is wasted, if we are to measure returns by the yield obtained. If some of the Cuban potato growers could have visited New Jersey the past month they would have found two outstanding things as far as potato growing is concerned. The first of these, an abundance of rainfall, would not have excited any curiosity on the part of the Cuban visitor. The methods adopted by some of our potato growers would, however, have been a revelation to these Cuban growers who are still planting potatoes by hand, and who, as the result of their labors, harvest less than half a crop, due to their failure to control diseases.

Not only Cuban growers but some of our growers as well would have gaped at the methods employed. On the Wm. Clayton farm at Freehold a crop of approximately 150 acres was planted with a two row planter drawn by a tractor. With this machine Mr. Clayton and his son planted 32 acres in a day and a half. Similar equipment was used by Alfred Sloan at Shirley. Mr. Sloan used South Jersey late crop seed planted in 34 inch rows, 9 inches in the row. This tendency to closer planting is apparent in all of the potato growing sections. In Central Jersey, in previous years, some growers planted 15 inches apart in 32 inch rows. This is much too far apart and constitutes a waste of land. The past year or two most of these growers reduced the distance of planting to 13

inches and this year a number were persuaded that 11 inches were even more advisable. A number of tests are being conducted this year, under field conditions, to determine the best planting distance.

Another new development is the use of the concentrated fertilizer. It is of interest to note that fertilizer mixtures analyzing a 10-16-14 are being used rather generally. In many instances the growers are trying these high power fertilizers on only a few acres but in other cases the concentrated mixtures are being used almost entirely. On the Wm. Clayton farm this is the case; most of his large acreage will be planted with a 10-16-14 mixture. A freeze up on the river Rhine prevented Chas. B. Probasco from following out his original plan of fertilizing most of his land with an 18-30-55. He is, however, using mostly concentrated mixtures of another formula on his farm. In North Jersey also the growers will have an opportunity to observe the use of concentrated fertilizers since C. E. Snyder of Pittstown plans to use them on his entire acreage. The use of these materials means a considerable saving, both in time and money and the results of all the tests we have conducted the past four years indicate the concentrated mixtures to be as good as the old lime fertilizer.

In talking with the potato growers it is apparent that a larger acreage will be sprayed this year than ever before in the past. Some growers plan to rig up their own sprayer. James Ewart of Cranbury will no doubt have his own machine in operation. For most part, however, the growers plan to use the ready built machines. The men who plan to adopt this practice realize that unless they protect the vines from insects and diseases they cannot hope to secure the yields they should. We can't stress the importance of this too strongly. With but very few exceptions good seed was planted this year. This is the first step in the production of maximum

yields. It is only a step in the right direction, however, since if protection is not afforded the vines it is impossible to expect maximum returns from this seed.

In connection with the seed used for planting the crop it may be safely said that it is the best ever planted in the state. Very little non-certified seed was sold and the condition of the certified stock was better than usual. This year we visited a number of dealers in search of a few sacks of severely scabbed seed. The quest was in vain. Not many years ago it would have been a very simple matter to get all of the scabby seed we wanted. It is clear that the dealers are making every possible effort to supply the growers with the best seed obtainable.

This year is one of new developments in the potato industry. It will repay every potato grower to observe carefully the possibilities which lie in these various practices.

1929 ACREAGE

April 15 reports indicate rather heavy cuts in acreage in some of the southern states, the indicated acreage for these states for 1929 being only 69 per cent of last year's plantings. In the second early states there is an indicated reduction of 18, per cent over last year. In New Jersey all reports show a reduction of approximately 10 per cent. In the northern potato growing sections the indications are that the acreage this year will be approximately the same as in 1928.

Florida will soon clean up this year's crop. Shipments are far ahead of last season, nearly 3000 cars being shipped by April 20 as compared with 845 cars in 1929. South Carolina will begin shipping shortly after May 1 and with the heavy reduction in acreage should soon be off the market. In North Carolina also the acreage is cut over last year, reports are not in accord concerning the amount of the cut but it is probably about 30 per cent.

On the Eastern Shore of Virginia and Maryland the acreage has been decreased from 10 to 15 per cent, some reports going as high as 25 per cent.

According to the March 1 report made by potato growers, the intended United States potato acreage for 1929 is 3,418,000. From this intended acreage about 2 per cent should be deducted to allow for usual losses during the season, and this would mean 3,350,000 acres for harvesting next fall, compared with 3,825,000 harvested in 1928 and 3,476,000 in 1927. With average weather conditions this United States acreage would produce something like 390,000 bushels. Consequently, after the holdings of the 1928 crop are off the market, this suggested production would mean only about the usual supply of potatoes next season.

MARKING LAW

The attention of potato growers is called to a marking law which has been in effect since 1920 and which makes it mandatory that all fruits and vegetables that are packed in crates, covered baskets, carriers, sacks or other containers for sale shall be plainly and conspicuously marked or stamped with the name and address of the packer. This

applies to the shipper who buys potatoes and packs or to the producer who fills and closes his sacks at home. The law provides that the marking shall be in lettering not less than three-eighths of an inch in size, on the outside or top of the said crates, covered baskets, sacks or other containers, or **on a tag firmly fixed thereto.**

The Department of Weights and Measures claim that the law has been enforced in some localities in regard to potatoes in previous years, but in order that there be no misunderstanding, the word **sacks** was added by amendment during the present session of the legislature.

The object has been the protection not only of the purchaser but of the producers and shippers of quality potatoes, who sell their potatoes under a brand or name, against the unscrupulous shipper or dealer who uses second-hand sacks with a brand or name attached for the sale of second quality goods, to the injury of the reputation of the original party.

It is recommended that where second-hand sacks are used that they be turned inside out or old lettering be obliterated and a tag properly stamped or printed be fixed to the top of the sack.